Acer Altos R920 Series

User's Guide

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Acer Altos R920 Series
User's Guide

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Record the model number, serial number, purchase date, and place of purchase information in the space provided below. The serial number and model number are recorded on the label affixed to your server. All correspondence concerning your unit should include the serial number, model number, and purchase information.

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Acer Altos R920 Series

Model Name : R920

Part Number: MU.R2900.001

Purchase Date: _____

Place of Purchase: _____

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Notices

FCC declaration of conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The following local manufacturer/importer is responsible for this declaration:

Product:	Server
Model number:	R920
Name of responsible party:	Acer America Corporation
Address of responsible party:	333 West San Carlos St., San Jose, CA 95110, U. S. A.
Contact person:	Acer Representative
Phone number:	1-254-298-4000
Fax number:	1-254-298-4147

FCC notice

Class A devices do not have an FCC logo or FCC IDE on the label. Class B devices have an FCC logo or FCC IDE on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A equipment

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

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However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

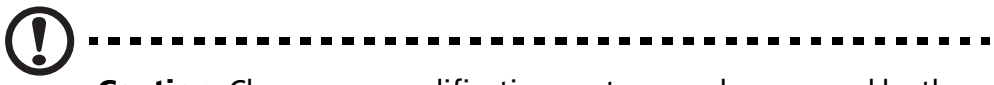
- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help

Notice: Shielded cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

Notice: Peripheral devices

Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class A limits may be attached to this equipment. Operation with noncertified peripherals is likely to result in interference to radio and TV reception.



Caution: Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the Federal Communications Commission, to operate this server.

Use conditions

This part complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice: Canadian users

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

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Remarque à l'intention des utilisateurs canadiens

Cet appareil numérique de la classe A est conforme a la norme NMB-003 du Canada.

Laser compliance statement

The CD or DVD drive used with this computer is a laser product. The CD or DVD drive's classification label (shown below) is located on the drive.

CLASS 1 LASER PRODUCT
CAUTION: INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.

APPAREIL A LASER DE CLASSE 1 PRODUIT
LASERATTENTION: RADIATION DU FAISCEAU LASER INVISIBLE EN CAS D'OUVERTURE. EVITTER TOUTE EXPOSITION AUX RAYONS.

LUOKAN 1 LASERLAITE LASER KLASSE 1
VORSICHT: UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHLL AUSSETZEN.

PRODUCTO LÁSER DE LA CLASE I
ADVERTENCIA: RADIACIÓN LÁSER INVISIBLE AL SER ABIERTO. EVITE EXPONERSE A LOS RAYOS.

ADVARSEL: LASERSTRÅLING VEDÅBNING SE IKKE IND I STRÅLEN.

VARO: LAVATTAESSA OLET ALTTINA LASERSÅTEILYLLE.

VARNING: LASERSTRÅLNING NÅR DENNA DEL ÅR ÖPPNAD ÅLÅ TUIJOTA SÅTEESEENSTIRRA EJ IN I STRÅLEN.

VARNING: LASERSTRÅLNING NAR DENNA DEL ÅR ÖPPNADSTIRRA EJ IN I STRÅLEN.

ADVARSEL: LASERSTRÅLING NAR DEKSEL ÅPNESSTIRR IKKE INN I STRÅLEN.

Macrovision copyright protection notice

"U.S Patent Nos. 4,631,603; 4,819,098; 4,907,093; 5,315,448; and 6,516,132."

This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovision, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.

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CE Declaration of conformity

We,

Acer Computer (Shanghai) Limited
3F, No. 168 Xizang Medium Road, Huangpu District,
Shanghai, China

Contact Person: Mr. Easy Lai
Tel: 886-2-8691-3089
Fax: 886-2-8691-3120
E-mail: easy_lai@acer.com.tw

Hereby declare that:

Product:	Server
Trade name:	Acer
Model number:	R920
SKU number:	R920xx ("x" = 0~9, a~z, A~Z or blank)

Is compliant with the essential requirements and other relevant provisions of the following EC directives, and that all the necessary steps have been taken and are in force to assure that production units of the same product will continue to comply with these requirements.

- **EMC Directive 2004/108/EC, amended by conformity with the following harmonized standards:**
  - EN55022:1998 + A1:2000 + A2:2003, AS/NZS CISPR22:2002, Class A
  - EN55024:1998 + A1:2001 + A2:2003
  - EN61000-3-2:2000 + A2:2005, Class D
  - EN61000-3-3:1995 + A1:2001
- **Low Voltage Directive 2006/95/EC as attested by conformity with the following harmonized standard:**
  - EN60950-1:2001 + A11:2004
- **RoHS Directive 2002/95/EC on the Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment**

Easy Lai
Director, Acer Computer (Shanghai) Limited

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Declaration of conformity for EU countries

Hereby, Acer, declares that this PC series is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Russian regulatory certification compliance

ME61

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Information for your safety and comfort

Safety instructions

Read these instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product.

Turning the product off before cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

CAUTION for plug as disconnecting device

Observe the following guidelines when connecting and disconnecting power to the power supply unit:

- Install the power supply unit before connecting the power cord to the AC power outlet.
- Unplug the power cord before removing the power supply unit from the server.
- If the system has multiple sources of power, disconnect power from the system by unplugging all power cords from the power supplies.

CAUTION for accessibility

Be sure that the power outlet you plug the power cord into is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the electrical outlet.

Usage warnings

- Do not use this product near water. Never spill liquid of any kind onto or into the product.
- Do not place this product on an unstable cart, stand or table. If the product falls, it could be seriously damaged.
- Slots and openings are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

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- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock.
- To avoid damage of internal components and to prevent battery leakage, do not place the product on a vibrating surface.
- Never use it under sporting, exercising, or any vibrating environment which will probably cause unexpected short current or damage rotor devices, hard drives, optical drives, and even exposure risk from lithium battery pack.

Using electrical power

- This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord.
- If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
- Do not overload a power outlet, strip or receptacle by plugging in too many devices. The overall system load must not exceed 80% of the branch circuit rating. If power strips are used, the load should not exceed 80% of the power strip's input rating.
- This product's power supply is equipped with a three-wire grounded plug. The plug only fits in a grounded power outlet. Make sure the power outlet is properly grounded before inserting the power supply plug. Do not insert the plug into a non-grounded power outlet. Contact your electrician for details.

Warning! The grounding pin is a safety feature. Using a power outlet that is not properly grounded may result in electric shock and/or injury.

Note: The grounding pin also provides good protection from unexpected noise produced by other nearby electrical devices that may interfere with the performance of this product.

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- Use the product only with the supplied power supply cord set. If you need to replace the power cord set, make sure that the new power cord meets the following requirements: detachable type, UL listed/CSA certified, type SPT-2, rated 7 A 125 V minimum, VDE approved or its equivalent, 4.6 meters (15 feet) maximum length.

Safe listening

Follow these instructions, suggested by hearing experts, to protect your hearing.

- Gradually increase the volume until you can hear it clearly and comfortably and without distortion.
- After setting the volume level, do not increase it after your ears adjust.
- Limit the amount of time listening to music at high volume.
- Avoid turning up the volume to block out noisy surroundings.
- Turn the volume down if you can't hear people speaking near you.

Product servicing

Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.

Unplug this product from the wall outlet and refer servicing to qualified service personnel when:

- the power cord or plug is damaged, cut or frayed
- liquid was spilled into the product
- the product was exposed to rain or water
- the product has been dropped or the case has been damaged
- the product exhibits a distinct change in performance, indicating a need for service
- the product does not operate normally after following the operating instructions

Note: Adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

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Disposal instructions

Do not throw this electronic device into the trash when discarding. To minimize pollution and ensure utmost protection of the global environment, please recycle. For more information on the Waste from Electrical and Electronics Equipment (WEEE) regulations, visit http://global.acer.com/about/sustainability.htm.

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Tips and information for comfortable use

Computer users may complain of eyestrain and headaches after prolonged use. Users are also at risk of physical injury after long hours of working in front of a computer. Long work periods, bad posture, poor work habits, stress, inadequate working conditions, personal health and other factors greatly increase the risk of physical injury.

Incorrect computer usage may lead to carpal tunnel syndrome, tendonitis, tenosynovitis or other musculoskeletal disorders. The following symptoms may appear in the hands, wrists, arms, shoulders, neck or back:

- numbness, or a burning or tingling sensation
- aching, soreness or tenderness
- pain, swelling or throbbing
- stiffness or tightness
- coldness or weakness

If you have these symptoms, or any other recurring or persistent discomfort and/or pain related to computer use, consult a physician immediately and inform your company's health and safety department.

The following sections provide tips for more comfortable computer use.

Finding your comfort zone

Find your comfort zone by adjusting the viewing angle of the monitor, using a footrest, or raising your sitting height to achieve maximum comfort. Observe the following tips:

- Refrain from staying too long in one fixed posture.
- Avoid slouching forward and/or leaning backward.
- Stand up and walk around regularly to remove the strain on your leg muscles.
- Take short rests to relax your neck and shoulders.
- Avoid tensing your muscles or shrugging your shoulders.
- Install the external display, keyboard and mouse properly and within comfortable reach.
- If you view your monitor more than your documents, place the display at the center of your desk to minimize neck strain.

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Taking care of your vision

Long viewing hours, wearing incorrect glasses or contact lenses, glare, excessive room lighting, poorly focused screens, very small typefaces and low-contrast displays could stress your eyes. The following items provide suggestions on how to reduce eyestrain.

- Eyes
  - Rest your eyes frequently.
  - Give your eyes regular breaks by looking away from the monitor and focusing on a distant point.
  - Blink frequently to keep your eyes from drying out.
- Display
  - Keep your display clean.
  - Keep your head at a higher level than the top edge of the display so your eyes point downward when looking at the middle of the display.
  - Adjust the display brightness and/or contrast to a comfortable level for enhanced text readability and graphics clarity.
  - Eliminate glare and reflections by:
    - placing your display in such a way that the side faces the window or any light source
    - minimizing room light by using drapes, shades or blinds
    - using a task light
    - changing the display's viewing angle
    - using a glare-reduction filter
    - using a display visor, such as a piece of cardboard extended from the display's top front edge
  - Avoid adjusting your display to an awkward viewing angle.
  - Avoid looking at bright light sources, such as open windows, for extended periods of time.

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Developing good work habits

Develop the following work habits to make your computer use more relaxing and productive:

- Take short breaks regularly and often.
- Perform some stretching exercises.
- Breathe fresh air as often as possible.
- Exercise regularly and maintain a healthy body.

Warning! We do not recommend using the computer on a couch or bed. If this is unavoidable, work for only short periods, take breaks regularly, and do some stretching exercises.

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1 System tour

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The Altos R920 is a powerful, feature-rich platform designed to deliver superior performance, scalability, and flexibility to meet the needs of various network environments. It is specially suited for minimizing system downtime and maintaining mission critical applications accessible.

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Features summary

This section lists the impressive computing features of the Altos R920 system.

Processor

- Supports one to four physical processors
  - Quad-core Intel® Xeon™ processors 7300 series
  - Dual-core Intel® Xeon™ processors 7200 series
  - 64-bit Intel® Xeon™ processors with 2 x 4 MB L2 cache
  - 1066 MHz front side bus
- Support for the following Intel technologies[1]:
  - Extended Memory 64-bit Technology
  - Enhanced Intel SpeedStep Technology
  - Demand-Based Switching for power savings
  - Execute-disable bit for hardware support of security features
  - Intel Virtualization Technology
  - Enhanced power and thermal management

Chipset

- Intel 7300 Chipset Memory Controller Hub (north bridge)
- Intel Enterprise South Bridge 2 (ESB2) I/O Controller (south bridge)

Memory subsystem

- Supports up to 128 GB of DDR2-667 MHz (PC2-5300) fully buffered DIMM (FBDIMM) memory modules
- Supports one to four removable memory boards
  - Each memory board supports:
    - Eight FBDIMM slots
    - A fault LED to report DIMM failures and error conditions
    - Connection through x16 PCI-Express slots

1 For more information on these Intel technologies, visit the Intel Xeon web site at http://www.intel.com/products/processor/xeon7000/index.htm.

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- Memory reliability, availability, and serviceability (RAS) features
  - Memory scrub engine
  - Memory mirroring
  - Memory sparing

Note: For more information on system RAS features, refer to "Appendix B: Memory configuration" on page 163.

Media storage

- One 5.25-inch device bay supports:
  - DAT 160 tape drive
  - AIT-2 tape drive
  - LT0-3 half-height tape drive
- Up to eight hot-plug drive carriers
  - 2.5-inch SAS hard disk drives

SAS controller

- LSI 1078 SAS controller
- Supports RAID levels 0, and 1

Integrated hardware RAID (optional)

- Supports RAID levels 0, 1, 5, 6, 10, 50, and 60 with installation of the following components:
  - RAID activation key (iButton)
  - DDR2-667 registered ECC DIMM for RAID cache
  - RAID Battery Backup Unit (BBU). Available as an upgrade option.

Serial ATA port

- Two internal 7-pin vertical SATA ports
- Supports transfer rate of up to 3.0 GB/s

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Networking

- Intel ESB2 I/O controller
- Intel 82563EB Gigabit Ethernet controller with dual ports
- Intel 82575 Gigabit Ethernet controller with dual ports (optional I/O expansion module)
- Supports Intel I/O Acceleration Technology
- Supports boot from integrated SCSI (iSCSI)

PCI- Express I/O

- Two hot-plug x8 PCI Express slot
- Two x8 PCI Express slot
- Three x8 PCI Express slots (with x4 throughput)

Note: The PCI hot-plug function allows the removal of a standard PCI adapter from the system without stopping the software or powering down the unit.

Graphic interface

- ATI® ES1000 video controller with 32 MB video RAM

Server management

- Integrated Trusted Platform Module (TPM)
- Integrated Baseboard Management Controller (BMC) module
  - Intelligent Platform Management Interface (IPMI) 2.0 compliant
  - In-band and out-band server management
- Acer Remote Management Card/3 Revision 2 (ARMC/3 R2) module (optional)
  - High performance KVM redirection
  - Includes a dedicated NIC port
  - USB mouse, keyboard, and media redirection

Control panel

- Button control panel
- LCD control panel (optional)

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I/O ports

- Front
  - VGA/monitor port
  - Three USB 2.0 ports
- Rear
  - Serial port
  - VGA/monitor port
  - Two USB 2.0 ports
  - Four Gigabit LAN ports (RJ-45) (two ports optional)
  - Server management port (RJ-45) [2]

Operating system and software

- Operating system options:
  - Microsoft® Windows® Server 2003, x64 Edition
  - Microsoft® Windows® Server 2003
  - Red Hat® Enterprise Linux 5.0
  - Red Hat® Enterprise Linux 5.0, EM64T
  - SUSE® Linux Enterprise Server 10.0
  - SUSE® Linux Enterprise Server 10.0, EM64T
- Server management utilities and applications
  - Acer Server Manager (ASM) [3]
  - Acer EasyBUILD™ (includes SAS RAID Configuration Utility) [3]
  - Acer eBusiness Value Pack

2 Reserved for remote management of server. This requires installation of an ARMC/3 R2 module.
3 For more information on how to install and use ASM and EasyBUILD utilities, refer to the manual on the EasyBUILD DVD.

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Power supply

- Two 110/220-volts,1570-watt hot-swap (1+1) redundant power supply modules

System fan

- Two hot-swap redundant front system fan modules
- Four hot-swap redundant rear system fan modules (two rear fans optional)

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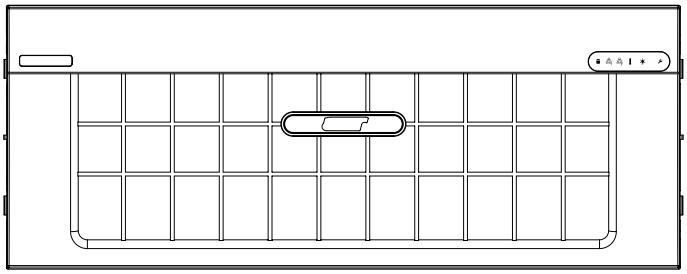
External and internal structure

Front bezel

The front bezel provides an interface for system management via status LED indicators. The light pipes on the backside of the front bezel allow the system status LEDs to be monitored when the front bezel is closed.



The front bezel is removable to allow access to server's hard drives, peripheral device, and control panel. For details on how to remove the front bezel, see "To remove the front bezel" on page 41.

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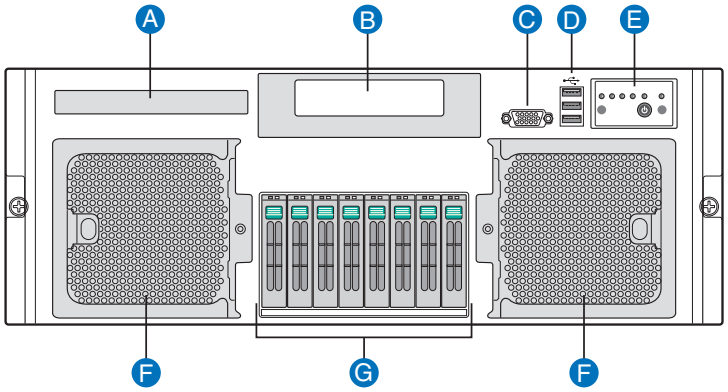
Front panel



Item	Icon	Component
A		DVD drive bay
B		5.25-inch drive bays
C		VGA/monitor port
D		USB 2.0 ports
E		Control panel
F		Hot-swap system fan modules
G		Hot-plug HDDs

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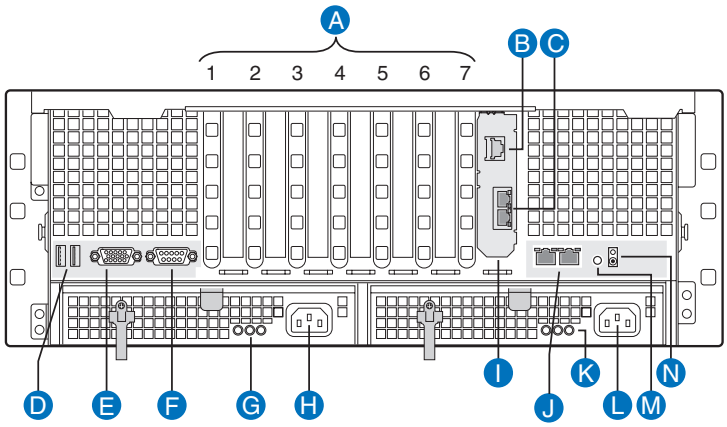
Rear panel



Item	Component
A1 - A7	A1 Hot-plug PCI Express x8 slot A2 Hot-plug PCI Express x8 slot A3 PCI Express x8 slot A4 PCI Express x8 slot A5 PCI Express x8 slot (with x4 throughput) A6 PCI Express x8 slot (with x4 throughput) A7 PCI Express x8 slot (with x4 throughput)
B	ARMC/3 R2 Ethernet port*
C	I/O expansion module Ethernet ports
D	USB 2.0 ports
E	VGA/monitor port
F	Serial port
G, K	Power supply indicators
H, L	AC input power connector
I	I/O expansion module (optional)
J	Gigabit LAN ports (10/100/1000 Mbps)
M	System ID button
N	System ID indicator

* Reserved for remote management of server. This requires installation of an ARMC/3 R2 module.

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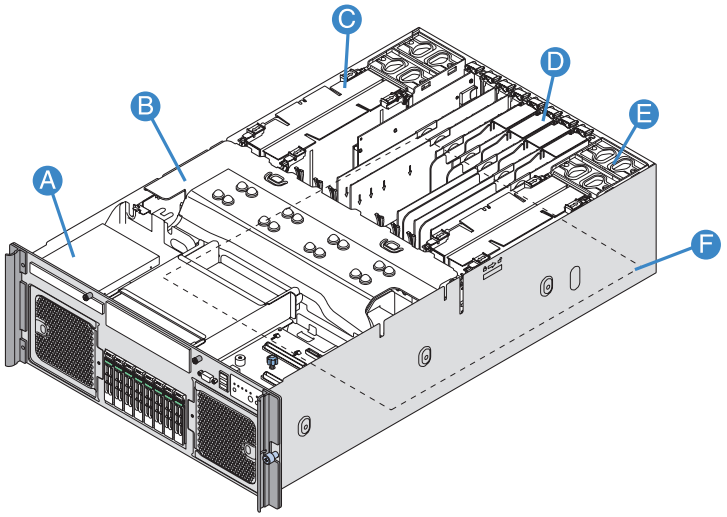
Internal components



Item	Component
A	DVD drive bay
B	Processor air baffle
C	Memory board
D	Plastic PCI slot divider and PCI slots
E	Rear system fan modules
F	Mainboard

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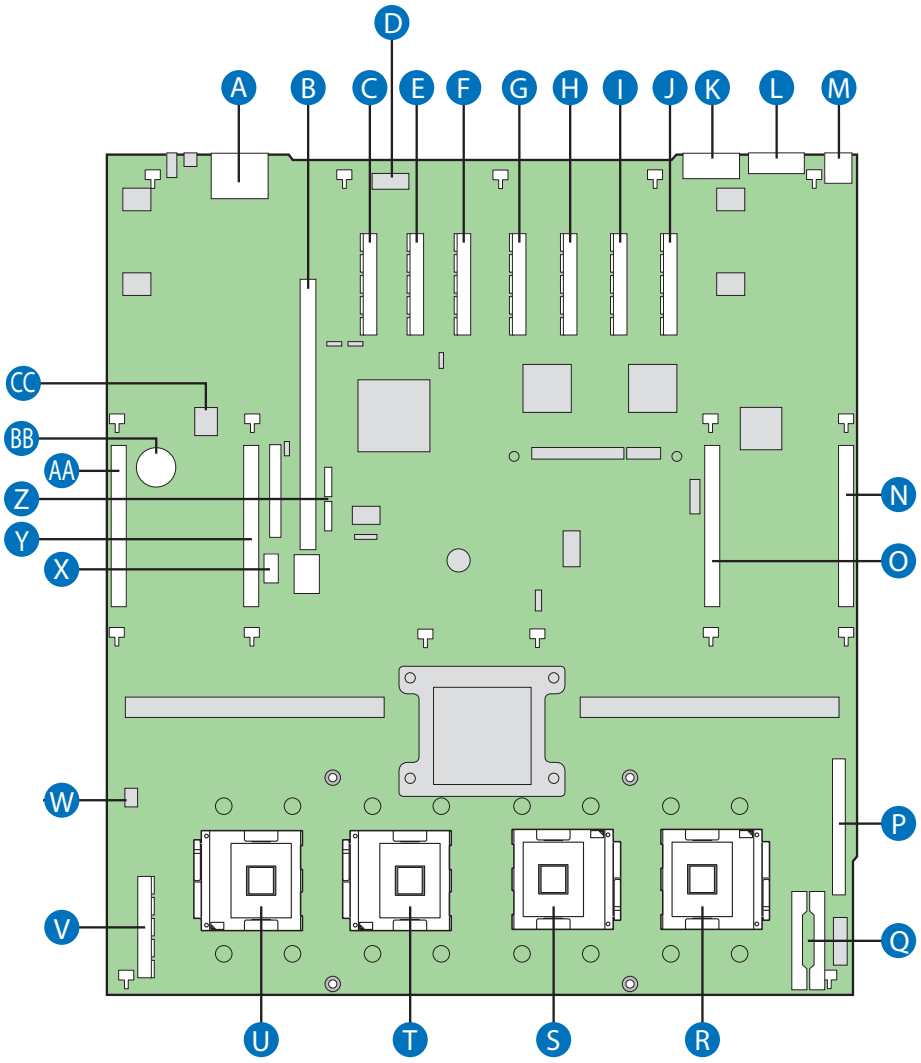
System boards

Mainboard

The mainboard becomes accessible once you open the system. It should look like the figure shown below.



Item	Description	Item	Description
A	Dual Ethernet ports	P	Front panel connector
B	I/O expansion module slot	Q	Power distribution board (PDB) signal connector

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Item	Description	Item	Description
C	PCI Express x8 (with x4 throughput) - (slot 7)	R	CPU socket 1
D	Serial port A (internal)	S	CPU socket 2
E	PCI Express x8 (with x4 throughput) - (slot 6)	T	CPU socket 3
F	PCI Express x8 (with x4 throughput) - (slot 5)	U	CPU socket 4
G	PCI Express x8 (slot 4)	V	SAS module slot
H	PCI Express x8 (slot 3)	W	Chassis intrusion
I	Hot-plug PCI Express x8 (slot 2)	X	Internal USB port*
J	Hot-plug PCI Express x8 (slot 1)	Y	Memory board slot C
K	Serial port B	Z	SATA connectors
L	VGA port	AA	Memory board slot D
M	USB 1 (top) USB 2 (bottom)	BB	Real-time clock battery
N	Memory board slot A	CC	Trusted Platform Module (U2D1)
O	Memory board slot B		

* Reserved for tape drives.

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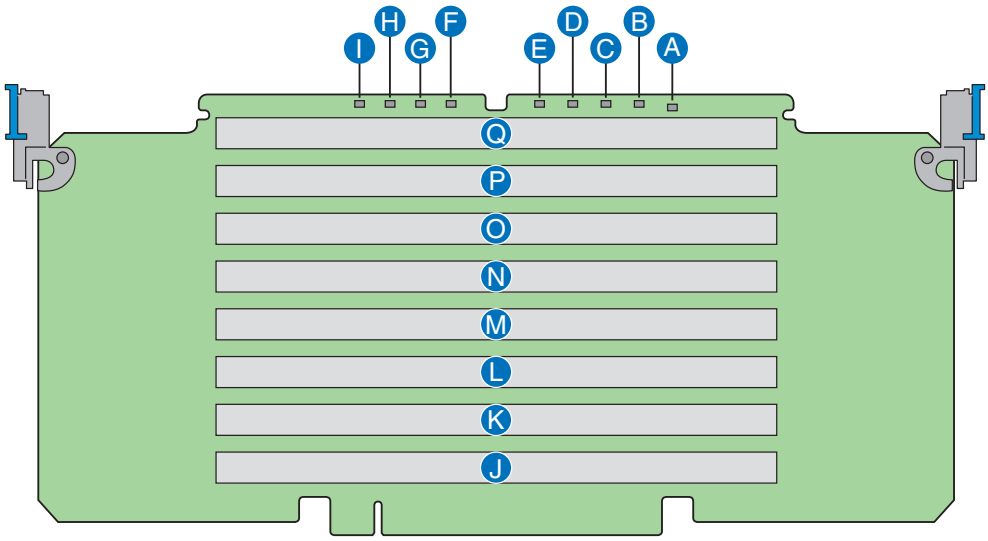
Memory board

The memory board connects to the mainboard through x16 PCI Express slots.



Item	Description	Item	Description
A	Power good indicator	J	DIMM 1 slot
B	DIMM 1 fault indicator	K	DIMM 2 slot
C	DIMM 2 fault indicator	L	DIMM 3 slot
D	DIMM 3 fault indicator	M	DIMM 4 slot
E	DIMM 4 fault indicator	N	DIMM 5 slot
F	DIMM 5 fault indicator	O	DIMM 6 slot
G	DIMM 6 fault indicator	P	DIMM 7 slot
H	DIMM 7 fault indicator	Q	DIMM 8 slot
I	DIMM 8 fault indicator		

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Control panel

The Altos R920 system supports either the button control panel, providing basic functionality, or the LCD control panel, which adds additional server management features. Both control panels utilize a combination of control buttons, status LED indicators, along with I/O ports, to centralize system control, monitoring, and accessibility.

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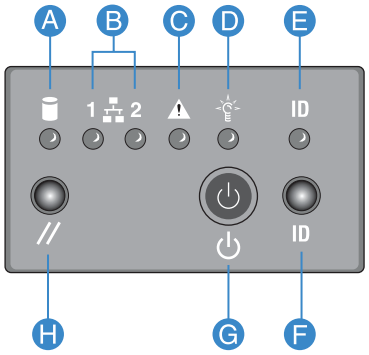
Button control panel



Item	Icon	Component
A		HDD (hard disk drive) activity indicator
B	1 2	LAN1 status indicator displays network activity in either LAN ports on the mainboard. LAN2 status indicator displays network activity in either LAN ports on the optional I/O expansion module.
C		Status/fault indicator
D		Power indicator
E	ID	System ID indicator
F	ID	System ID button
G		Power button
H	//	Reset button

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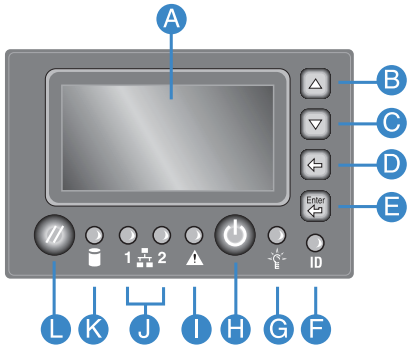
LCD control panel (optional)



Item	Icon	Component
A		LCD display
B		Scroll up button
C		Scroll down button
D		Back button
E		Select button
F	ID	System ID indicator
G		Power indicator
H		Power button
I		Status/fault indicator
J	1 2	LAN1 status indicator displays network activity in either LAN ports on the mainboard. LAN2 status indicator displays network activity in either LAN ports on the optional I/O expansion module.
K		HDD (hard disk drive) activity indicator
L	//	Reset button

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Control panel button function overview

The following table list and describe the function of the control buttons available on the control panel.

Control button	Function
NMI button	Puts the server in a halt-state for diagnostic purposes and allows you to issue a non-maskable interrupt. After using the interrupt, a memory download can be performed to determine the cause of the problem.
Reset button	Reboots and initializes the system.
Power/sleep button	Toggles the system power on and off. This button also functions as a sleep button if enabled by an ACPI-compliant operating system.
System ID button	Toggles the front panel ID LED and the mainboard system ID LED on and off. The mainboard system ID LED is visible through the rear of the chassis and allows you to locate the server you're working on from behind a rack of servers.
Scroll up button	With an LCD control panel, use these navigation buttons to do the following. • Navigate through the menu options. • Select an option in the menu and confirm your selection.
Scroll down button	
Back button	
Select button	

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System LED indicators

This section describes the different LED indicators located on

- Control panel
- Hot-plug HDD carrier
- Hot-swap fan module
- Hot-plug power supply module
- LAN port
- Hot-plug PCI Express slot
- Memory board

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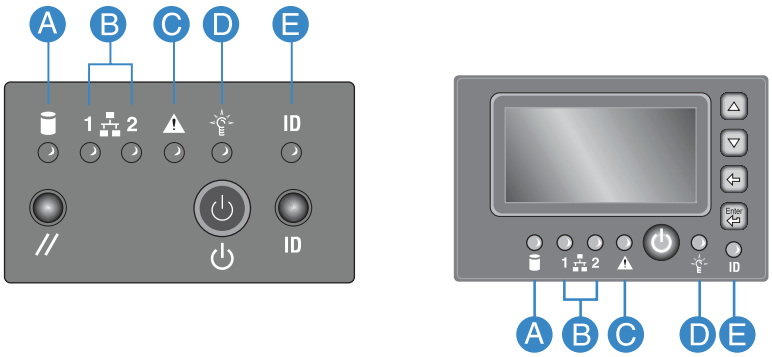
Control panel LED indicators



The following table list and describe the LED indicators available on the mini or optional full-function control panel.

Item	LED indicator	Color	LED status	System status	Description
A	HDD activity	Green	On	—	HDD is installed and functioning correctly. **Note:** LED may blink if all drives are active at the same time.
		Green	Blinking	—	HDD is active.
		Amber	On	—	HDD or HDD slot failure.
		Amber	Slow blinking (~1 Hz)	—	A predictive HDD or HDD slot failure or rebuild is in process.
		Amber	Fast blinking (~2.5 Hz)	—	HDD rebuild is interrupted or rebuild on empty slot.

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Item	LED indicator	Color	LED status	System status	Description
B	LAN1, LAN2 status 1 2	Green	On	• LAN1 active • LAN2 active	• Network activity in either LAN ports on the mainboard. • Network activity in either LAN ports on the optional I/O expansion module.
		Green	Blinking	Active	Network access
		—	Off	Idle	No activity
C	Status/ fault ⚠	·—	Off	Not Ready	• AC power off • POST error
		Green	On	Ready	System booted and ready.
		Green	Blinking	Degraded	• System is in a degraded state. • Processor or DIMM disabled.
		Amber	On	Critical condition	• System failure. • Critical power supply, blower, voltage, or temperature failure.
		Amber	Blinking	Non-critical condition	• Redundant power supply or blower failure. • Non-critical blower, voltage, and temperature failure.

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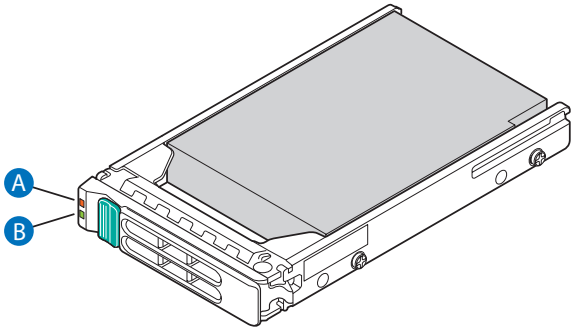
Item	LED indicator	Color	LED status	System status	Description
D	Power	—	Off	Power off	System is not powered on.
		Green	On	Power on	System has power applied to it.
		—	Off	S4/S5	System in ACPI S4 or S5 state (power off).
		Green	Blinking	S1	System in ACPI S1 state (sleep mode).
		Green	On	S0	System in ACPI S0 state (legacy power on).
E	System ID ID	Blue	On	—	System identification is active.
		—	Off	—	Identification is disabled.

Hot-plug HDD carrier LED indicators



Item	Color	Status	Description
A	Amber	Flashing	HDD is not powered on and has a fault condition.
	Amber + green	Alternate flashing	• HDD is powered on and rebuilding RAID. • HDD is powered on and has a fault condition.

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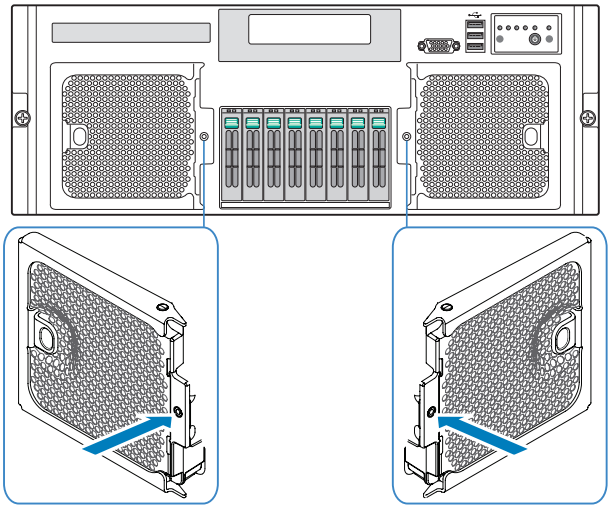
Item	Color	Status	Description
B	Green	On	HDD is installed and working correctly.
		Flashing	HDD is active.
		Off	• No HDD is installed. • HDD is initiated but has no current activity.

Hot-swap fan module LED indicators



LED indicator	Color	Status	Description
Fan good	—	Off	Fan normal operation.
Fan fault	Amber	On	Fan failure (Non-critical condition).

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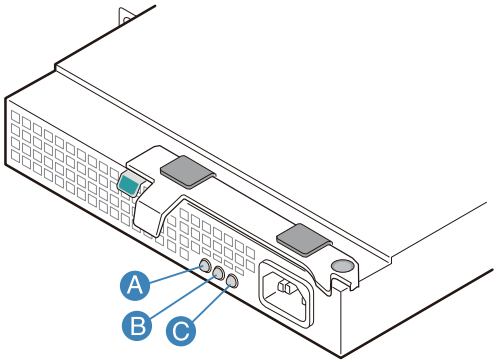
Hot-plug power supply module LED indicators



Item	LED indicator	Color	Status	Description
A	Power good	Green	On	System has power applied to it.
B	Fault	Amber	On	• Power rail failure. • Power supply is in a latched state.
C	AC OK	Green	On	AC power cord is plugged into an active AC power source.

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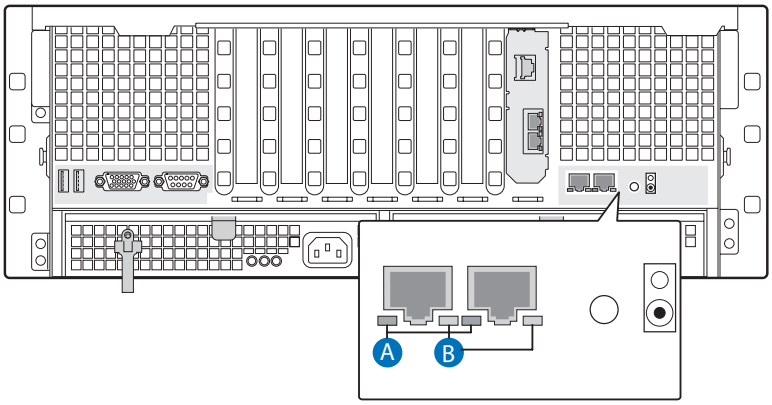
LAN port LED indicators



Item	LED indicator	Color	Status	Description
A	Status	Green	On	Network link is detected.
			Off	No network connection.
			Blinking	Network connection in place.
B	Speed	—	Off	10 Mbps connection
		Green	On	100 Mbps connection
		Amber	On	1000 Mbps connection

Hot-plug PCI Express slot LED indicators

The PCI slots 1 and 2 have a LED indicator to display the PCI hot-plug status.

LED indicator	Color	Status	Description
Power	Off	Power off	All main rails are removed from the slot. Card can be inserted or removed.
	Green, on	Power on	PCI slot 1 or 2 is powered on. Card cannot be inserted or removed.
	Green, blinking	Power transition	PCI slot 1 or 2 is in the process of changing state. Card cannot be inserted or removed.

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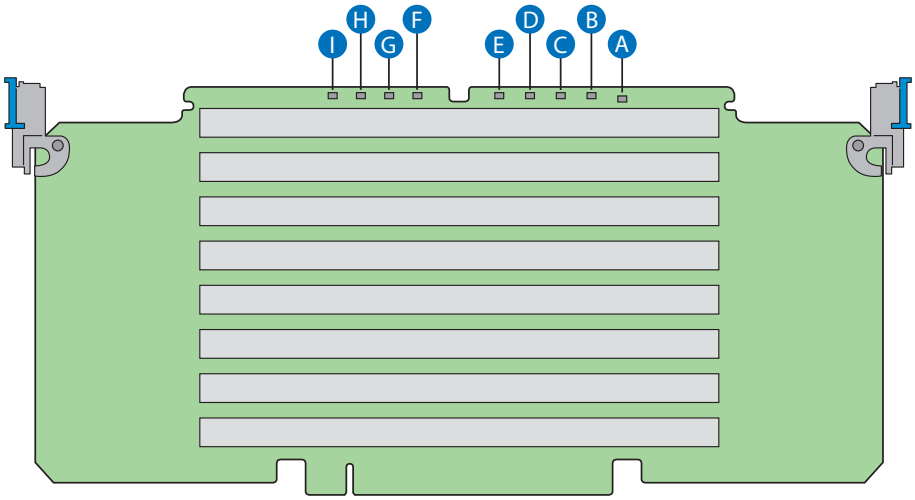
LED indicator	Color	Status	Description
Attention	Off	Normal	Normal operation
	Amber, on	Attention	Power failure or operational problem at the slot.
	Amber, blinking	Locate	Slot is being identified.

Memory board LED indicators

The LEDs on the memory board indicate the status of the memory board power and DIMM.



Item	LED indicator	Color	Description
A	Power good	Green, on	Power is detected. The memory board power is good.
		Off	Power is not detected on all boards.
B-I	DIMM 1 to 8 fault	Amber, on	DIMM installed in DIMM slots is malfunctioning and needs to be replaced.
		Off	DIMM is functioning properly.

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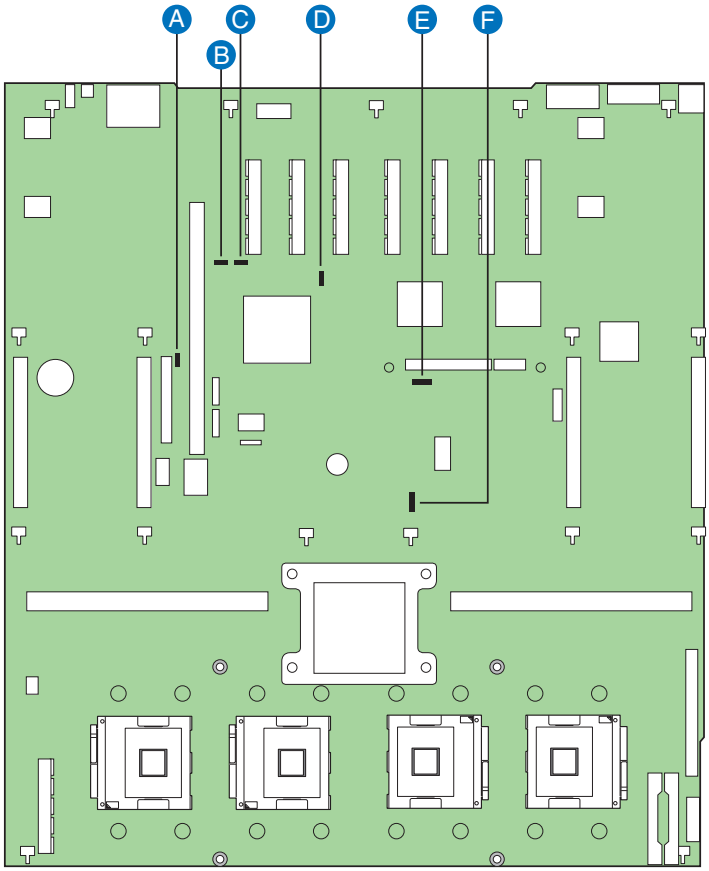
System jumpers



Item	Name	Location	Default	Settings
A	Rolling BIOS	J3D1	1-2 (Empty) 2-3 (Stuff)	Force other bank Normal mode
B	Password disable or clear	J3C2	1-2 (Stuff) 2-3 (Empty)	Password protect Password disabled/ cleared
C	Clear CMOS/ NVRAM	J3C3	1-2 (Stuff) 2-3 (Empty)	Normal Forced CMOS/ NVRAM clear
D	BMC force update	J5C1	1-2 (Stuff) 2-3 (Empty)	Disable BMC force update Enable BMC force update

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Item	Name	Location	Default	Settings
E	BMC flash write protect	J6D1	1-2 (Stuff) 2-3 (Empty)	Disable flash write protect Enable flash write protect
F	Circuit breaker	J6F1	1-2 (Empty) 2-3 (Stuff)	20 A/110 V (USA) 15 A/100 V (Japan)

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2 System setup

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This chapter gives you instructions on how to set up the system. Procedures on how to connect peripherals are also explained.

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Setting up the system

Pre-installation requirements

Selecting a site

Before unpacking and installing the system, select a suitable site for the system for maximum efficiency. Consider the following factors when choosing a site for the system.

- Near a grounded power outlet
- Clean and dust-free
- Stable surface free from vibration
- Well-ventilated and away from sources of heat
- Secluded from electromagnetic fields produced by electrical devices such as air conditioners, radio and TV transmitters, etc.

Checking the package contents

Check the following items from the package:

- Acer Altos R920 system
- Acer EasyBUILD™
- Acer eBusiness ValuePack
- Acer Altos R920 accessory box

If any of the above items are damaged or missing, contact your dealer immediately.

Save the boxes and packing materials for future use.

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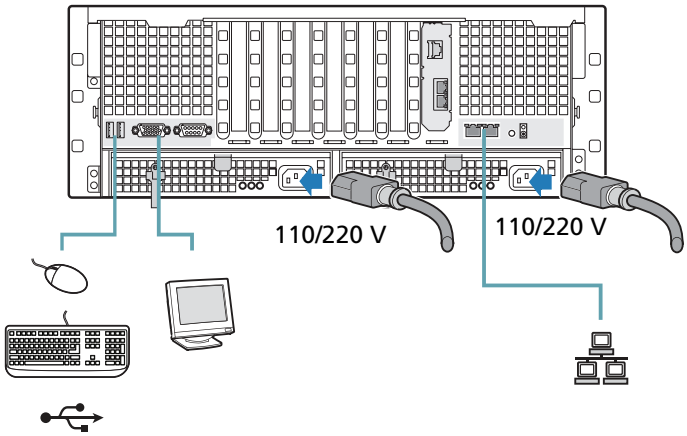
Connecting peripherals

Refer to the illustration below for specific connection instructions on the peripherals you want to connect to the system.



Note: Consult the operating system manual for information on how to configure the network setup.

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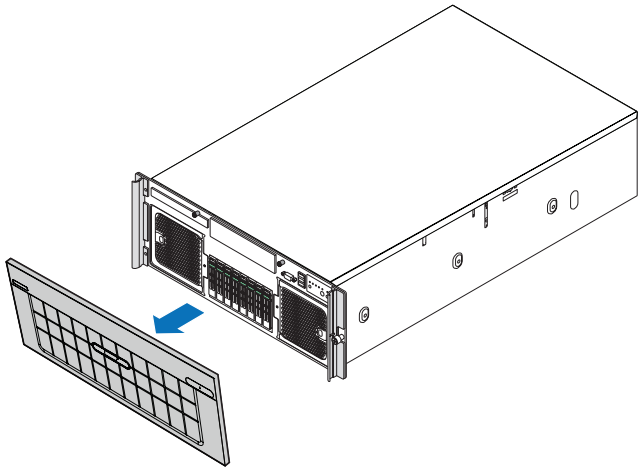
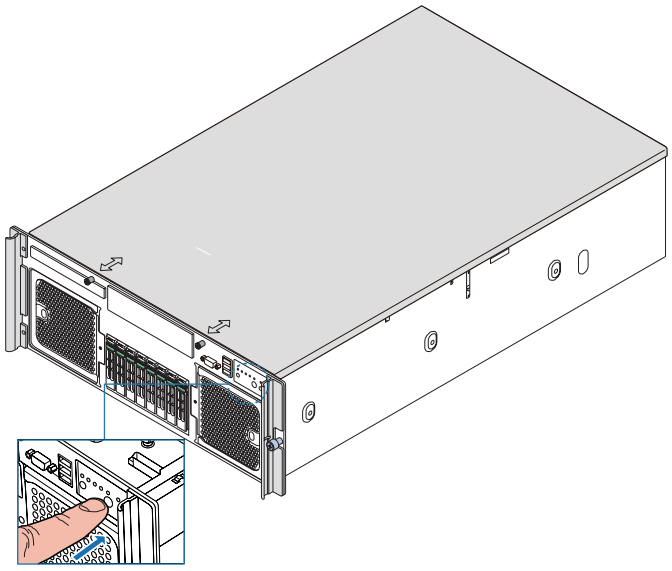
Turning on the system

After making sure that you have properly set up the system, applied power, and connected all the necessary peripherals, you can now power on the system.

1 Remove the front bezel.



2 Press the power button.



3 The system starts up and displays a welcome message on the monitor. After that, a series of power-on self-test (POST) messages appear. The POST messages indicate if the system is running well or not.

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Note: If the system does not turn on or boot after pressing the power button, go to the next section for the possible causes of the boot failure.

If the POST finds any problems, the system will emit a beep code followed by an error message displayed on the monitor. Aside from the POST messages, you can determine if the system is in good condition by checking if the following occurred.

- The power indicator on the control panel lights up green.
- The Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard light up.

Power-on problems

If the system does not boot after you have applied power, check the following factors that might have caused the boot failure.

- The external power cable may be loosely connected.

  Check the power cable connection from the power source to the power cable socket on the rear panel. Make sure that the cable is properly connected to the power source and to the power cable socket.
- No power comes from the grounded power outlet.

  Have an electrician check your power outlet.
- Loose or improperly connected internal power cables.

  Check the internal cable connections. If you are not confident to perform this step, ask a qualified technician to assist you.

Warning! Make sure all power cords are disconnected from the electrical outlet before performing this task.

Note: If you have gone through the preceding actions and the system still fails to boot, ask your dealer or a qualified technician for assistance.

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Configuring the system OS

The Altos R920 system comes with Acer EasyBUILD that allows you to conveniently install your choice of operating system. To start using EasyBUILD, follow the steps below.

1 Locate the EasyBUILD DVD included in the system package.

2 With the system turned on, gently press the DVD drive Stop/Eject button.

3 When the disc tray slides open, insert the EasyBUILD DVD with the label or title side of the disc facing upward.

Note: When handling the disc, hold it by the edges to avoid smudges or fingerprints.

4 Gently press the disc down to make sure that it is properly inserted.

Caution! While pressing the disc, be careful not to bend the disc tray. Make sure that the disc is properly inserted before closing the disc tray. Improper insertion may damage both the disc and the DVD drive.

5 Gently press the drive Stop/Eject button again to close the disc tray.

6 The Acer EasyBUILD sequence begins. Follow all onscreen instructions.

For more information, refer to the Acer EasyBUILD Installation guide.

Note: Windows or Linux OS CD is needed when you install the OS with the EasyBUILD DVD.

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Turning off the system

There are two ways to turn off the server—via software or via hardware. The software procedure below applies to a system running on a Windows OS. For other OS shutdown procedures, refer to the related user documentation.

To turn off the system via software:

1 Press **Ctrl**+**Alt**+**Delete** on the attached keyboard or click the **Start** on the Windows taskbar.

2 Select **Shut Down.**

3 Select **Shut down** from the drop-down menu, then click **OK**.

To turn off the system via hardware:

If you cannot shut down the server via software, press the power button for at least four seconds or until the server shuts down. Quickly pressing the button may put the server in a Suspend mode only.

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3 System upgrade

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This chapter discusses the precautionary measures and installation procedures you need to know to upgrade the system.

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Installation precautions

Before you install any server component, we recommend that you read the following sections. These sections contain important ESD precautions along with pre-installation and post-installation instructions.

ESD precautions

Electrostatic discharge (ESD) can damage the processor, disk drives, expansion boards, motherboard, memory modules and other server components. Always observe the following precautions before you install a server component.

- Do not remove a component from its protective packaging until you are ready to install it.
- Do not touch the component pins, leads, or circuitry.
- Components with a Printed Circuit Board (PCB) assembly should always be laid with the assembly-side down.
- Wear a wrist grounding strap and attach it to a metal part of the server before handling components. If a wrist strap is not available, maintain contact with the server throughout any procedure requiring ESD protection.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and foam packing.

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Pre-installation instructions

Perform the steps below before you open the server or before your remove or replace any component.

Warning! Failure to properly turn off the server before you start installing components may cause serious damage. Do not attempt the procedures described in the following sections unless you are a qualified service technician.

1. Turn off the system and all the peripherals connected to it.
2. Unplug the power cord from the power outlet.
3. Unplug all peripheral cables from the system.
4. Place the system unit on a flat, stable surface.
5. Open the system according to the instructions on page 41.
6. Follow the ESD precautions described in this section when handling a server component.

Post-installation instructions

Perform the steps below after installing a server component.

1. See to it that all components are installed according to the described step-by-step instructions.
2. Reinstall all hardware structure or cable that have been previously removed.
3. Reinstall the top cover.
4. Reinstall the front bezel.
5. Reconnect the necessary cables.
6. Turn on the system.

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Opening the server

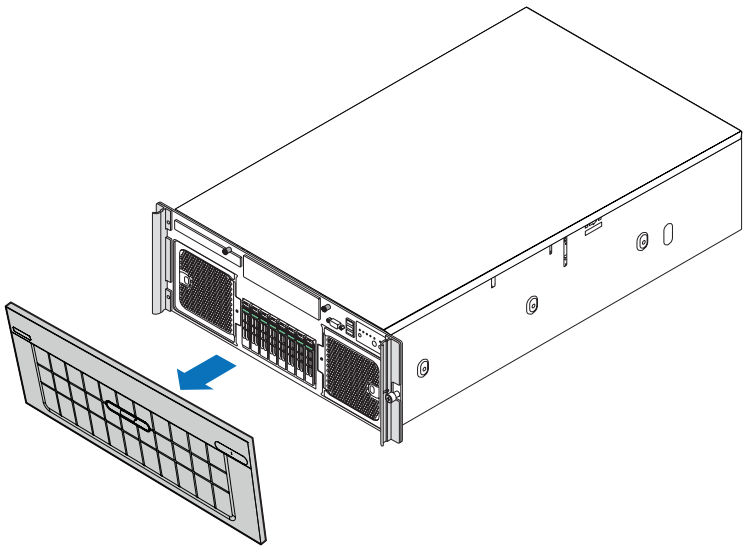
Caution! Before you proceed, make sure that you have turned off the system and all peripherals connected to it. Read the "Pre-installation instructions" section on page 40.

You need to open the server before you can install additional components. The front bezel and top cover are removable to allow access to the system's internal components. Refer to the following sections for instructions.

Removing and installing the front bezel

To remove the front bezel:

Grasp the front bezel at outer edge and pull straight out.



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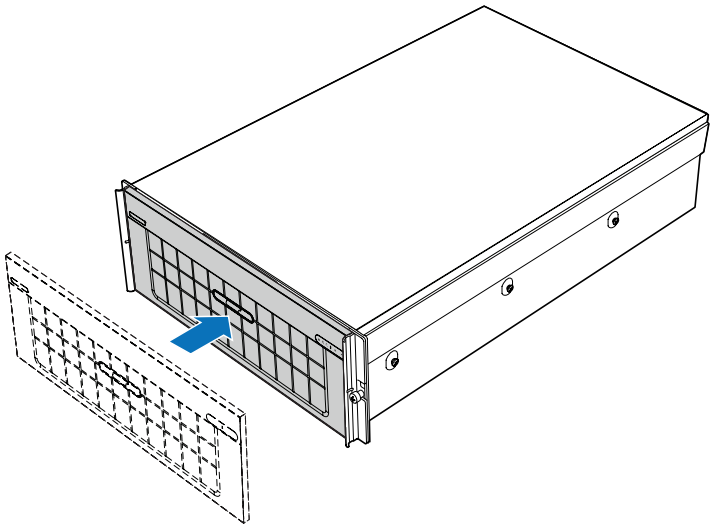
To install the front bezel:

Slide the front bezel onto the chassis.



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Removing and installing the top cover

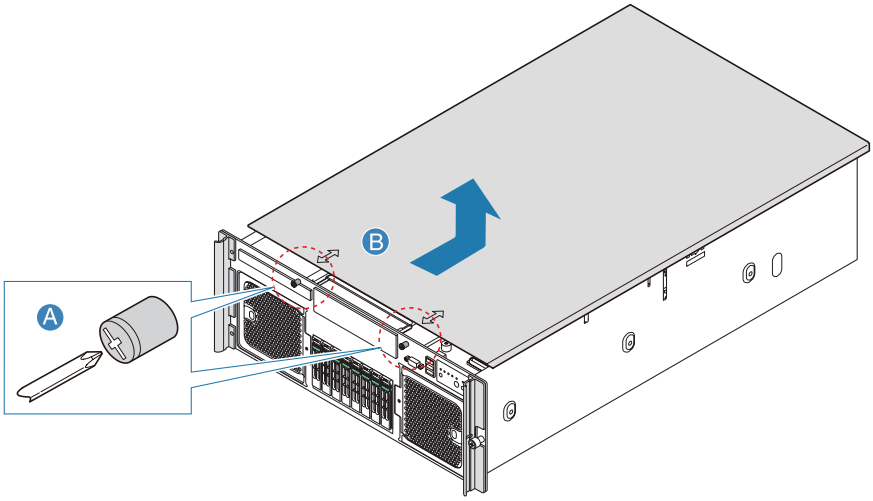
To remove the top cover:

1 Perform the pre-installation instructions described on page 39.

2 Loosen the two captive screws located on the faceplate of the chassis **(A)**.

3 Slide the top cover toward the back of the chassis until the tabs on the cover disengage with the slots on the chassis.

4 Lift the top cover away from the server and put it aside for reinstallation later **(B)**.



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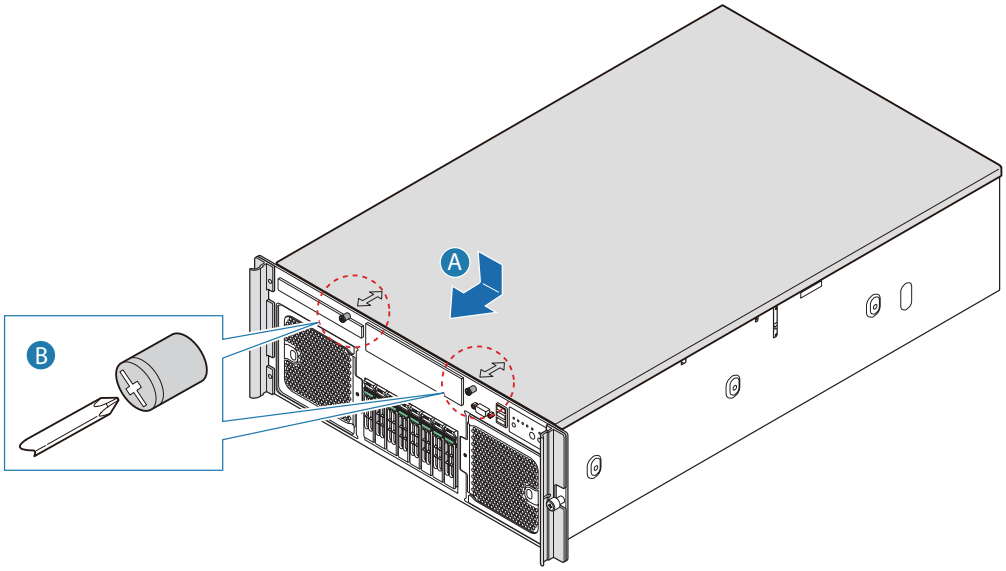
To install the top cover:

1 Perform the pre-installation instructions described on page 39.

2 Place the top cover on the chassis so that the tabs on the cover align with the slots on the chassis **(A)**.

3 Slide the top cover toward the front of the chassis until it is fully closed.

4 Tighten the captive screws on the faceplate of the chassis **(B)**.



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Removing and installing the processor air baffle

To remove the processor air baffle:

You will need to remove the processor air baffle to perform the following procedures.

- Removing and installing a heat sink
- Removing and installing a processor
- Removing and installing the SAS module
- Removing and installing the RAID activation key and RAID cache
- Removing and installing the RAID BBU

1 Perform the pre-installation instructions described on page 39.

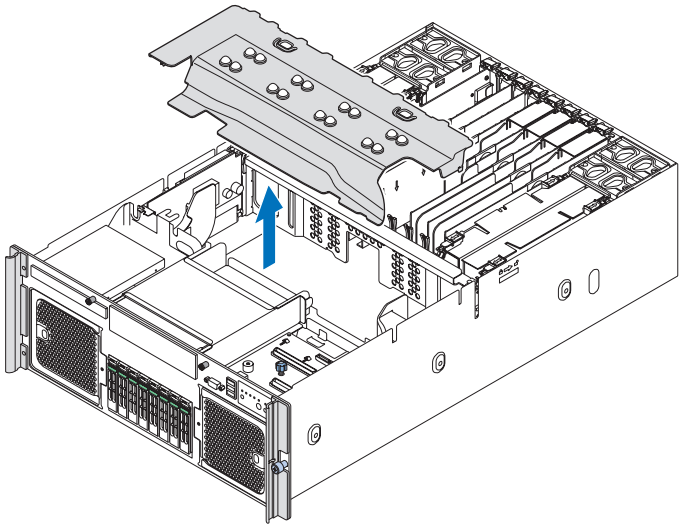
2 Disconnect the 100-pin cable from the mainboard connector on the front panel I/O board then move cable over the side of the chassis.

3 Disconnect any cables attached to the device in the 5.25-inch peripheral bay.

4 Insert your fingers into the holes on the top of the baffle.

5 Pull the baffle up and back to disengage the baffle from the two sheet-metal tabs on front of the baffle.

6 Lift the baffle from the chassis.



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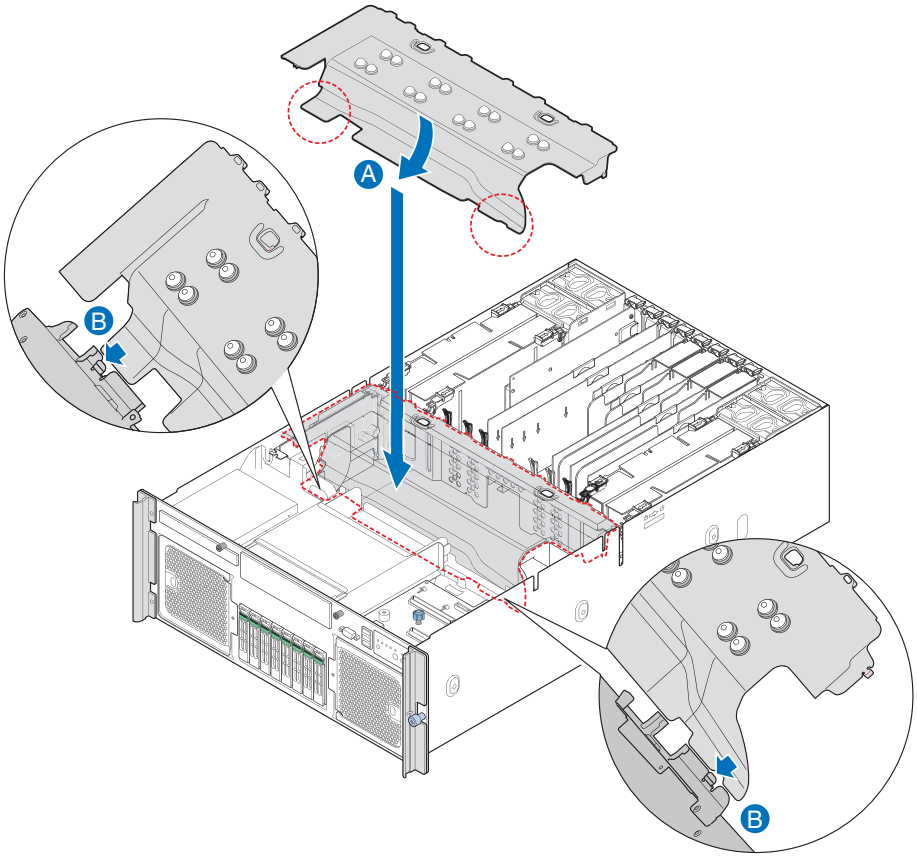
To install the processor air baffle:

1 Perform the pre-installation instructions described on page 39.

2 Insert the front of the processor air baffle **(A)** under the two metal tabs at the front of the baffle **(B)**, just below the SAS backplane board. One tab is located on each side of the chassis.



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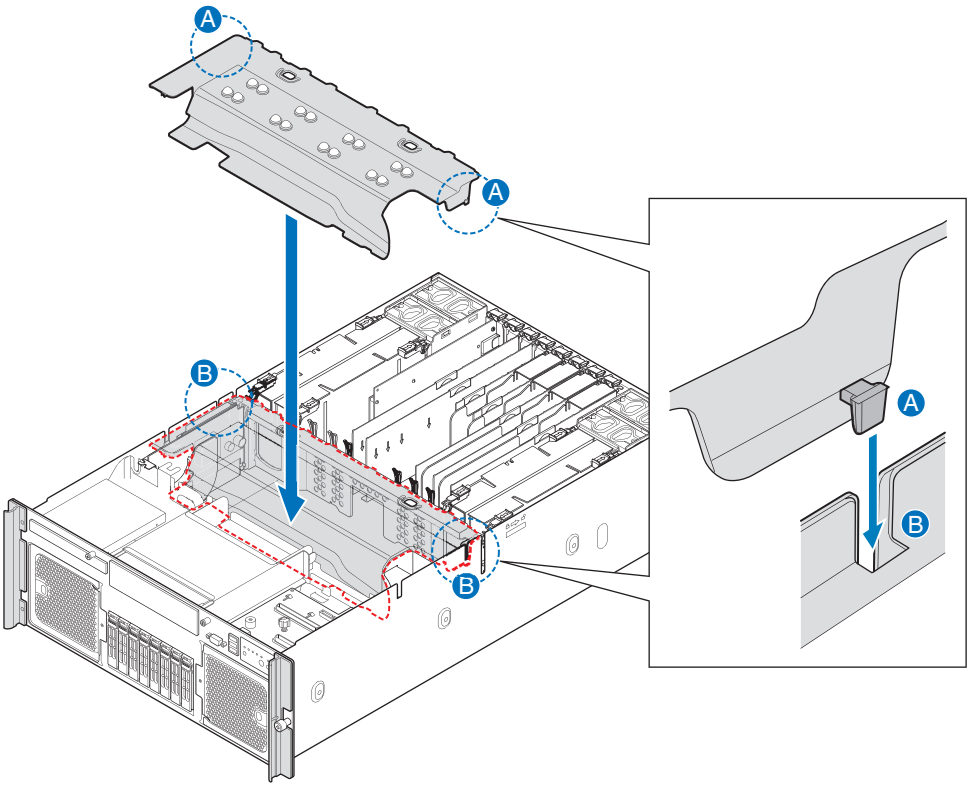
3 Lower the rear of the baffle into place **(A)**, making sure the guides on each side of the air baffle will correctly engage in the left and right chassis slots **(B)**.



4 Push down the air baffle to ensure it is fully seated.

5 Observe the post-installation instructions described on page 40.

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Configuring hot-pluggable components

Hot-pluggable components are the components that can be removed and replaced while the system is powered on. For this server model, it refers to the following components.

- Hard disk drive
- System fan assembly
- Power supply
- PCI card with OS hot-plug interface

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Removing and installing a hard disk drive

The system supports eight hot-plug drive carriers. Each carrier holds a standard 2.5-inch SAS hard drive.

Note: Use only Acer-qualified HDDs. To purchase an HDD, contact your local Acer representative.

Caution! To ensure proper airflow and server cooling, all drive bays must contain either a carrier with a hard drive installed in it or a hard disk carrier cover.

Determining drive status

Each HDD carrier features two status LED indicators to display the hard drive status. If you are replacing a failed HDD, determine which drive has failed by checking the drive status LED. For more information on how to determine the drive status, refer to “Control panel LED indicators” section on page 20.

To remove an HDD:

1 Observe the ESD precautions described on page 39.

2 Remove the front bezel. Perform the instructions described in “To remove the front bezel” section on page 41.

3 If you are removing a failed HDD, determine which drive has failed by checking the drive status LEDs.

4 Press the green HDD carrier latch **(A)**.

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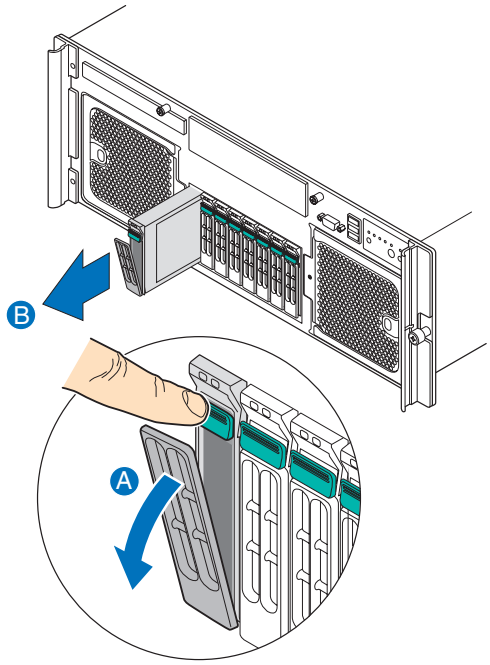
5 Pull the lever and slide the carrier from the chassis **(B)**.



6 Place the HDD carrier on a clean, static-free work surface.

7 If you are replacing a hard disk, remove the four screws that secure the hard disk to the HDD carrier, then remove the disk from the HDD carrier.

8 Keep the screws for later HDD installation.

To install an HDD:

Note: To purchase an HDD carrier, contact your local Acer representative.

1 Perform steps 1 through 5 of the "To remove an HDD" section on page 49.

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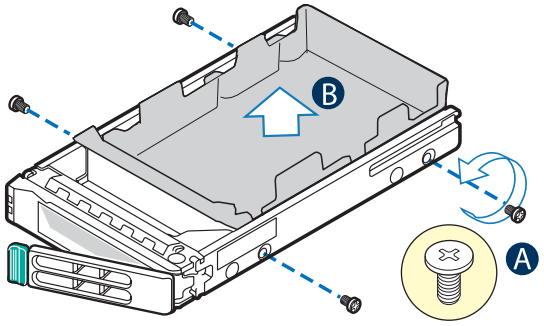
2 Remove the four screws that secure the air baffle to the HDD carrier **(A)**.

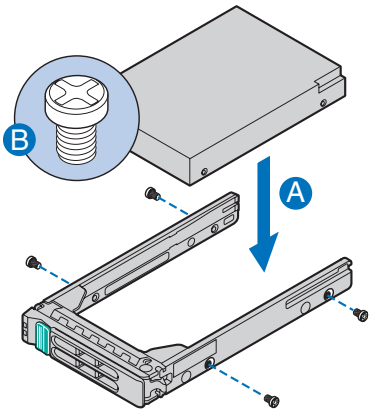
3 Remove the air baffle from the HDD carrier **(B)**.



4 Save the air baffle and screws for later use.

5 Remove the HDD from its protective packaging.

6 Install a hard disk on the HDD carrier, then secure it with the four screws **(A)** that came with the HDD carrier **(B)**.



7 With the lever still extended, slide the HDD carrier all the way into the drive bay **(A)**.

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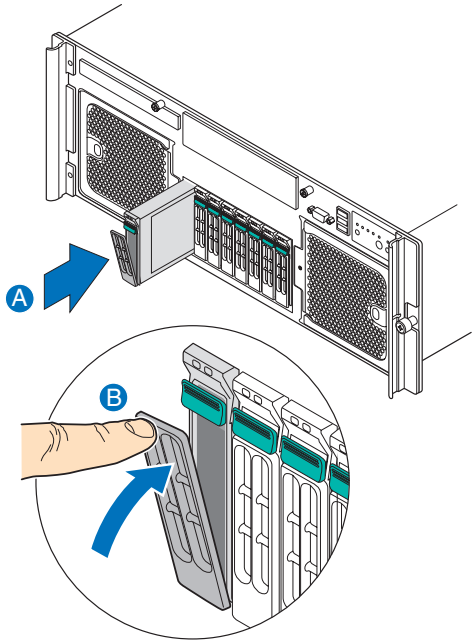
8 Use the lever to push the HDD carrier until it docks into place, then close the HDD carrier lever **(B)**.



9 Setup the new hard drive's RAID configuration.

For related instructions, refer to "RAID configuration utilities" on page 177.

Removing and installing the system fan

The system has two cooling fan assemblies — two fan modules for each assembly — located on the front panel and four cooling fans located at the rear of the chassis.

Cautions:

- System fan hot-swap operations should be performed only if a failure occurs in the fan assembly.
- System cooling is reduced during the fan replacement process. Do not leave a system fan removed for longer than two minutes.
- Do not touch the fan blades while they are turning.

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Determining fan status

Each fan or fan assembly has an amber LED to indicate a failed fan condition. If the amber LED is on, the fan assembly needs to be replaced. The LED remains off during normal operation.

To remove the front system fan assembly:

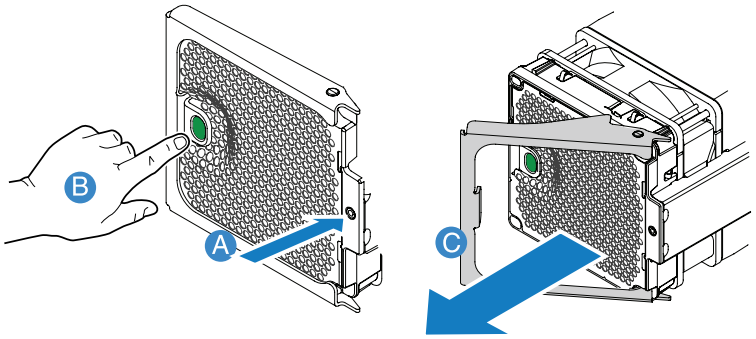
1 Observe the ESD precautions described on page 39.

2 Remove the front bezel. Perform the instructions described in "To remove the front bezel" section on page 41.

3 Locate the fan assembly you are replacing. If a fan in the assembly has failed the amber LED will be lit **(A)**.

4 Press the green button on the front of the fan assembly to release the handle **(B)**.

5 Use the handle to pull the fan from the system **(C)**.



To install the front system fan assembly:

Warning! To ensure proper system cooling, the replacement of a failed system fan module should be completed within one minute.

1 If necessary, remove the old front system fan assembly. See previous section.

2 Slide the new fan into the fan bay **(A)**.

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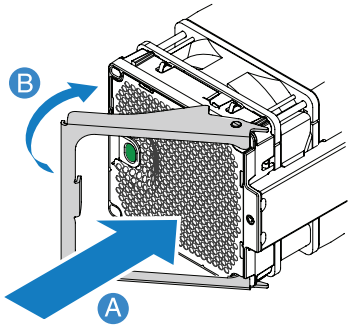
3 Push the handle closed until it clicks into place **(B)**.

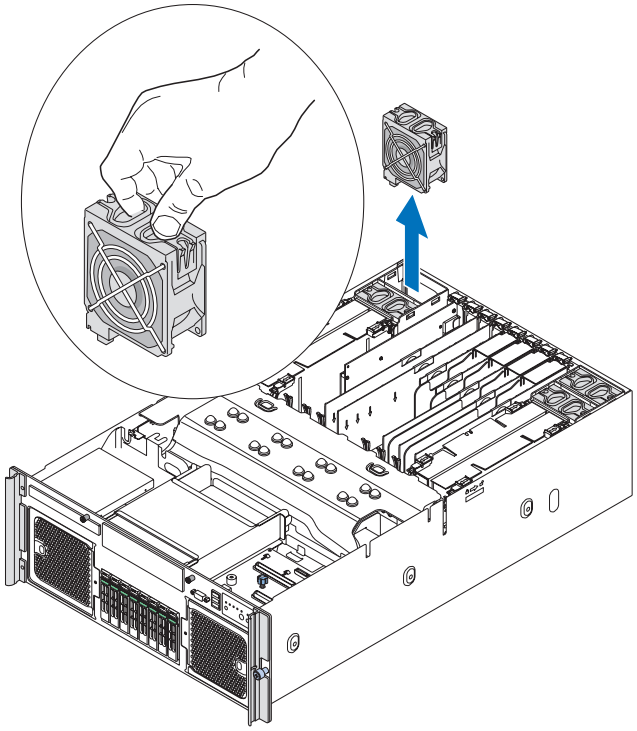


To remove a rear system fan:

1 Perform the pre-installation instructions described on page 39.

2 Locate the fan assembly you are replacing. If a fan in the assembly has failed the amber LED will be lit.

3 Grasp the fan by the finger holes and squeeze together, then lift the fan upward.



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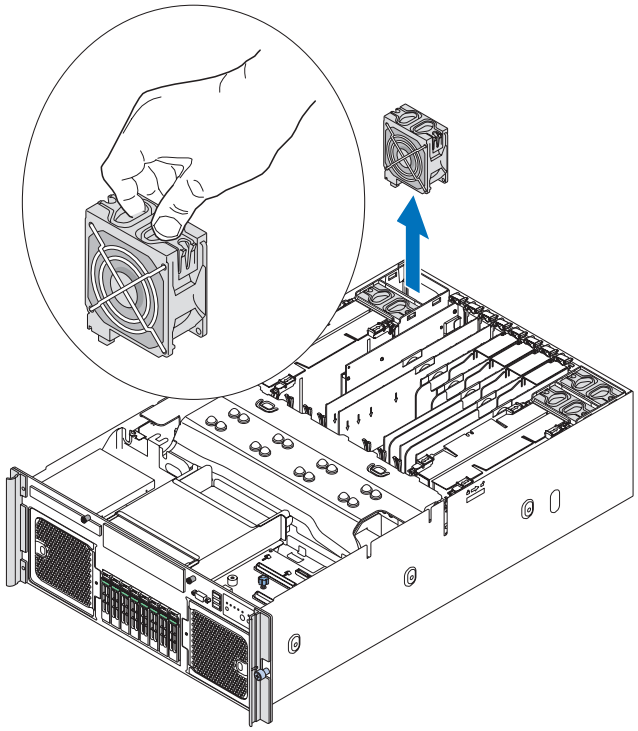
To install a rear system fan:

Warning! To ensure proper system cooling, the replacement of a failed system fan module should be completed within one minute.

1 If necessary, remove the old rear system fan. See previous section.

2 Lower the new fan into the fan bay.

3 Push down on the fan until it clicks into place.



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Removing and installing a power supply

The server has two power supply bays on the rear panel that accept hot-swap redundant power supply modules. The system ships out with at least one power supply module installed.

Power supply redundancy is available if two power supplies are installed. A redundant power configuration enables a fully-configured system to continue running even if one power supply module fails.

WARNING! To reduce the risk of personal injury or damage to the equipment, the installation of power supply modules should be referred to individuals who are qualified to service server systems and are trained to deal with equipment capable of generating hazardous energy levels.

WARNING! To reduce the risk of personal injury from hot surfaces, observe the thermal labels on each power supply module. You can also consider wearing protective gloves.

WARNING! To reduce the risk of personal injury from electric shock hazards, do not open the power supply modules. There are no serviceable parts inside the module.

Caution! Electrostatic discharge can damage electronic components. Make sure that you are properly grounded before handling a power supply module.

Caution! The system operating voltage range is 110 to 240 VAC. Do not plug the power cord into an incorrect voltage source.

Determining power supply status

The power supply module has three status LED indicators to display the power supply status. If the center LED is lit, the power supply needs to be replaced. For more information on how to determine the power supply status, refer to “Hot-plug power supply module LED indicators” section on page 24.

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To remove a power supply:

Caution: Power supply hot-swap operations should be performed only if a failure occurs in the power supply.

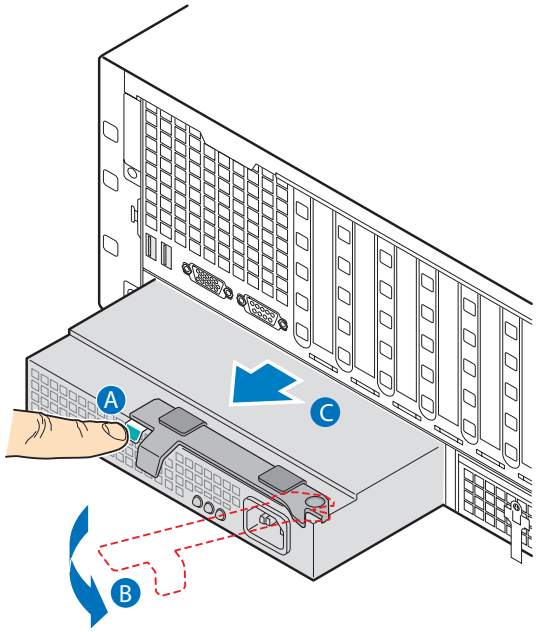
1 Observe the ESD precautions described on page 39.

2 Remove the AC power cord from the power supply.

3 Press down on the latch to release the power supply handle **(A)**.

4 Open the handle on the power supply **(B)**.

5 Pull the power supply from the chassis and set it on a clean, static-free surface **(C)**.



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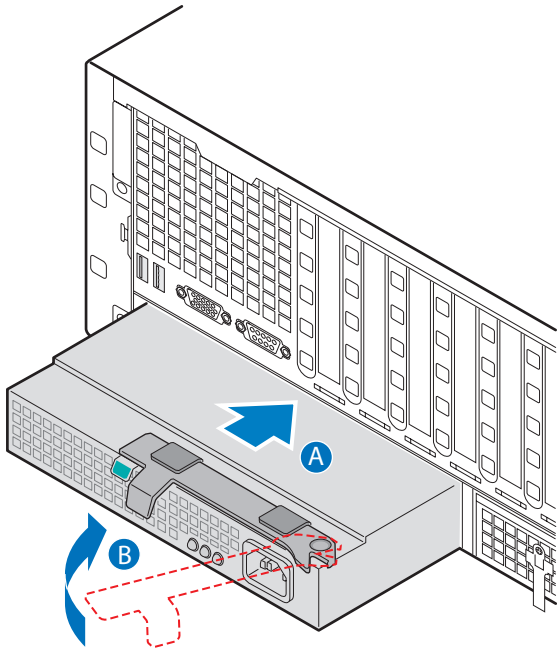
To install a power supply:

1 If necessary, remove the old power supply. See previous section.

2 With the handle in the open position, push the power supply in the bay fully **(A)**.

3 Rotate the handle to the closed position **(B)**.

4 Tighten the thumbscrew to secure the power supply **(C)**.



5 Plug the power cord into the AC receptacle on the power supply.

6 Verify that the LEDs on the power supply are functioning. Refer to the “Hot-plug power supply module LED indicators” section on page 24 for more information.

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Removing and installing a PCI card

Important: Only PCI add-in cards in PCI slots 1 and 2 are hot-pluggable. If you are installing or removing a PCI card from PCI slot 3 through 7, see page 82 for more information.

Caution: Expansion slot covers must be installed over all vacant slots to maintain the electromagnetic emission characteristics of the server and to ensure proper system cooling.

Determining PCI slot status

The PCI slots 1 and 2 have a LED indicator to display the PCI hot-plug status. For more information on how to determine the slot status, refer to "Hot-plug PCI Express slot LED indicators" section on page 25.

To remove a hot-plug PCI card with OS hot-plug interface:

1 Perform the pre-installation instructions described on page 39.

2 If you are using a Microsoft Windows operating system, double-click the **Unplug/Eject** icon in the taskbar to open the Unplug or Eject Hardware menu.

3 Select the device to be removed and click **Stop**.

4 Make sure that the power LED on the rear of the PCI slot is turned off before disconnecting any cables attached to the card.

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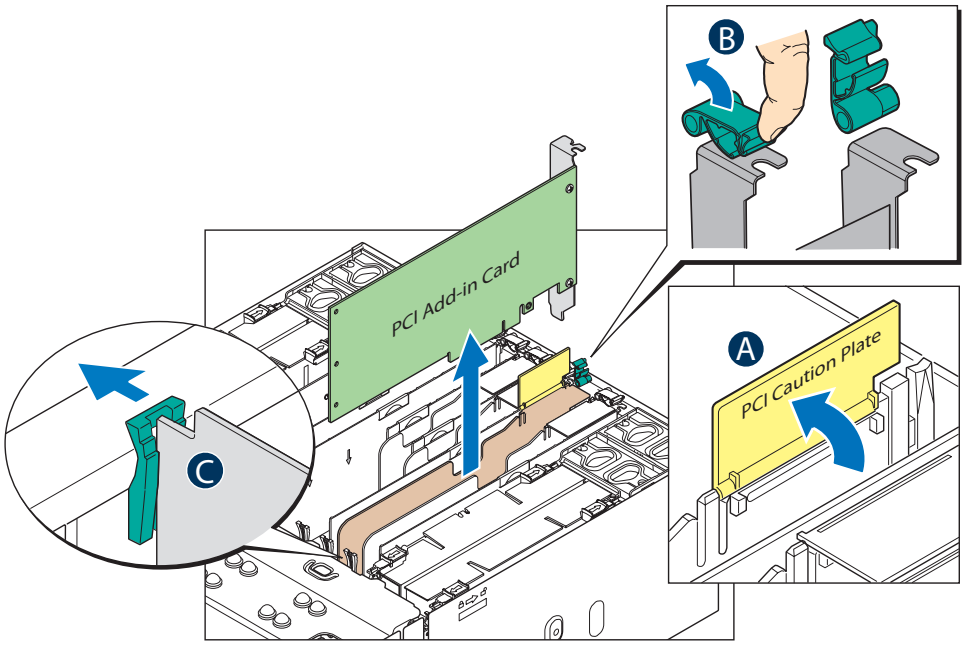
5 Open the yellow caution plate **(A)**.

6 Rotate the slot retention latch on the rear of the card slot upward **(B)**.

7 Release the vertical edge of the card and pull it away from the chassis **(C)**.



8 Store the card in an antistatic protective wrapper.

9 If installing a new PCI card, see “To install a new PCI hot-plug PCI card” section.

10 Observe the post-installation instructions described on page 40.

To remove a hot-plug PCI card with hardware interface:

1 Perform the pre-installation instructions described on page 39.

2 Press the attention button for this slot.

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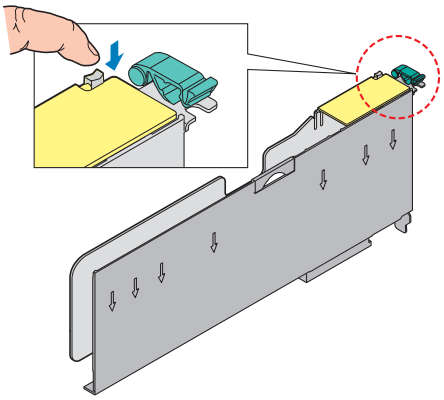
Note: Press the attention button again within five seconds to abort the hot-plug operation.

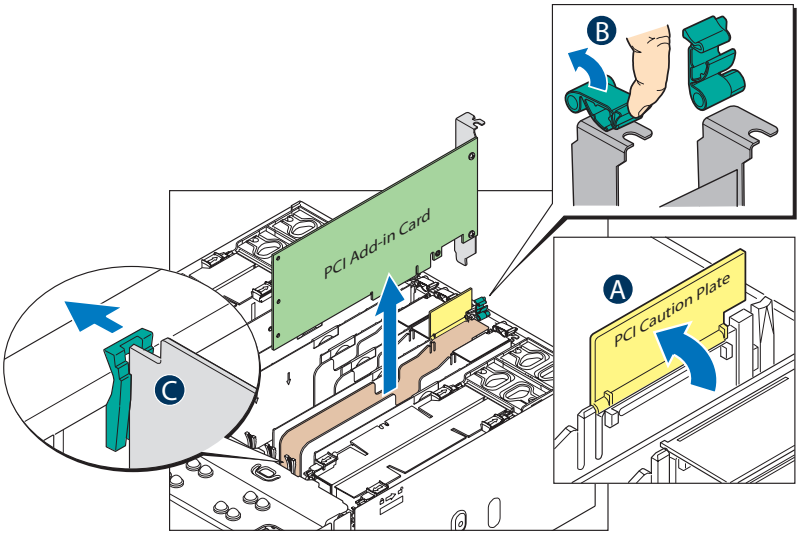


3 Make sure that the power LED on the rear of the PCI slot is turned off before disconnecting any cables attached to the card.

4 Open the yellow caution plate **(A)**.

5 Rotate the slot retention latch on the rear of the card slot upward **(B)**.

6 Release the vertical edge of the card and pull it away from the chassis **(C)**.



7 Store the card in an antistatic protective wrapper.

8 If installing a new PCI card, see “To install a new PCI hot-plug PCI card” section.

9 Observe the post-installation instructions described on page 40.

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To install a new hot-plug PCI card:

1 If your server is operating, use your OS to power down the PCI slot.

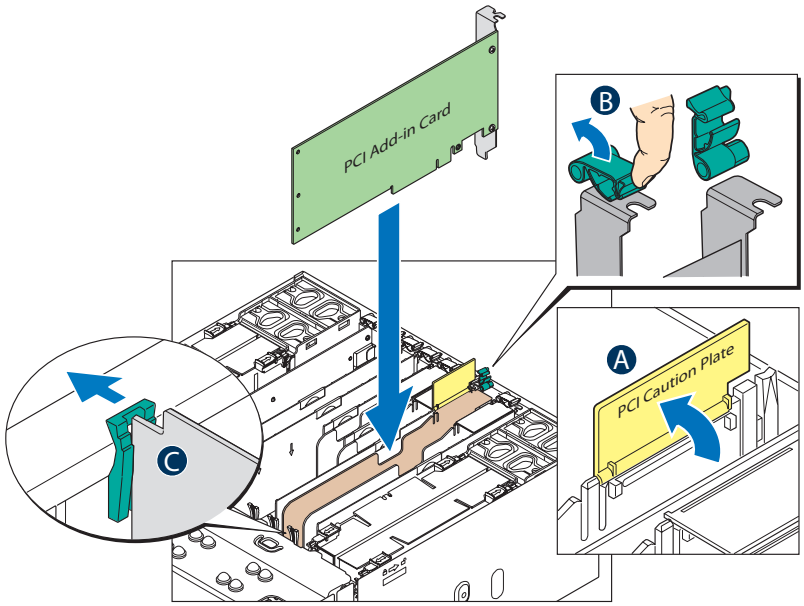
2 Perform the pre-installation instructions described on page 39.

3 Open the yellow caution plate **(A)**.

4 Rotate the slot retention latch on the rear of the card slot upward **(B)**.

5 Remove the PCI card from its protective packaging.

6 Align then insert the card into the selected slot. Make sure that the card is properly seated **(C)**.



7 Rotate the retention latch downward.

8 Connect any required cable to the card.

9 When using the hot-plug PCI card with OS hot-plug interface:

- Wait for the software user interface to appear on your monitor and then confirm the device to be enabled.
- Wait for the power LED to turn on.

If using the hot-plug PCI card with hardware interface:

- Press the attention button for the slot. If you need to abort the hot-plug operation, press the attention button again within five seconds.
- Wait for power LED to turn on.

10 Observe the post-installation instructions described on page 40.

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Configuring cold-pluggable components

Cold-pluggable components are the components that require the system to be powered down before you can remove or replace them. The cold-pluggable components installed in the server include.

- DVD drive
- 5.25-inch drive
- Processor
- Memory board assembly
- DIMM module
- PCI card
- I/O expansion module
- ARMC/3 R2 module
- SAS module
- RAID activation key and RAID cache
- RAID BBU

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Removing and installing the DVD drive

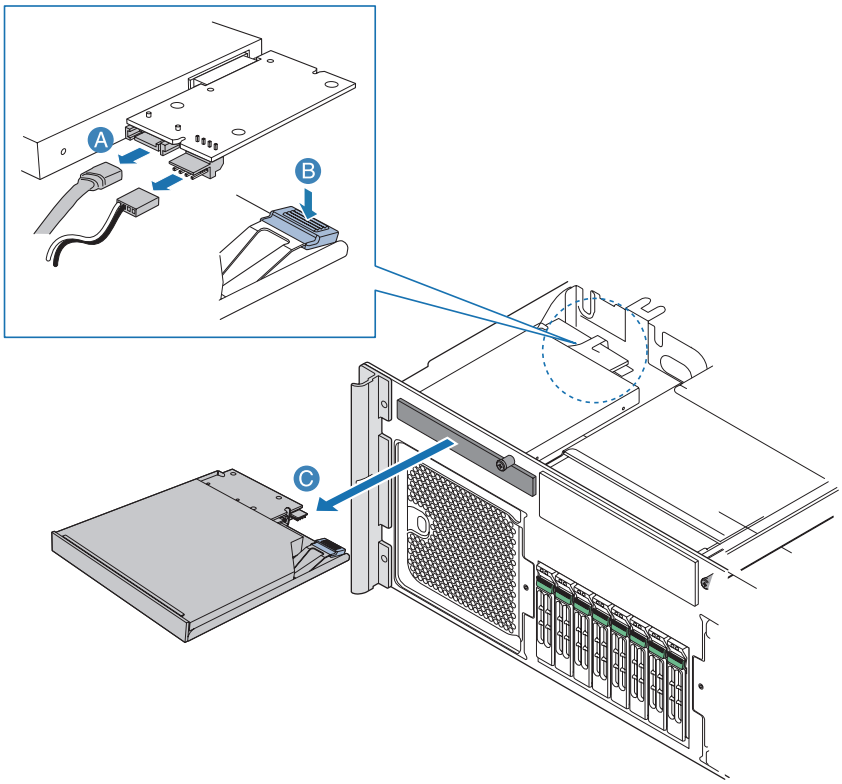
To remove the DVD drive:

1 Perform the pre-installation instructions described on page 39.

2 Disconnect the power and SATA cables from the SATA-to-IDE converter board on the rear of the media device **(A)**.

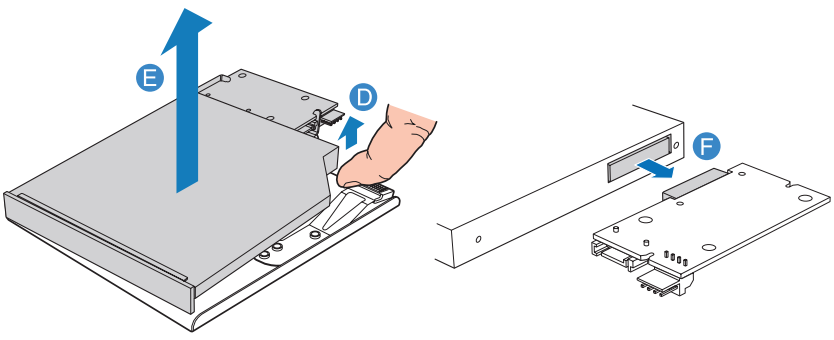
3 Press the blue release latch on the media device carrier **(B)**.

4 Slide the media device from the front opening in the faceplate of the system **(C)**.



5 Lift the rear right corner of the media device to remove it from the carrier **(D)** and **(E)**.

6 Remove the SATA-to-IDE converter board **(F)**.



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7 Observe the post-installation instructions described on page 40.

To install the DVD drive:

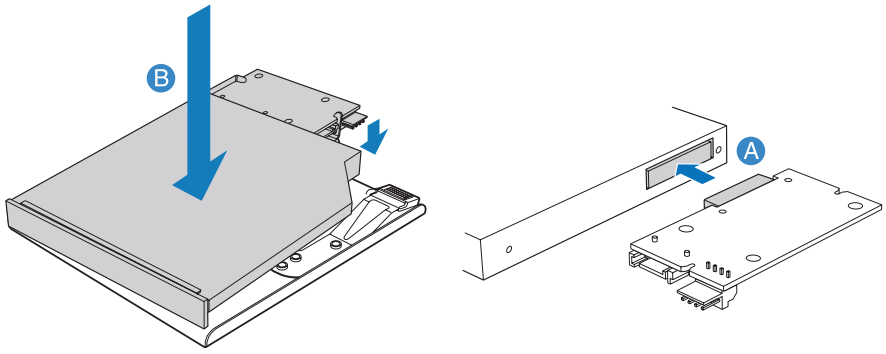
1 Perform the pre-installation instructions described on page 39.

2 If necessary, remove the old DVD drive. See previous section.

3 Remove the new drive from its protective packaging.

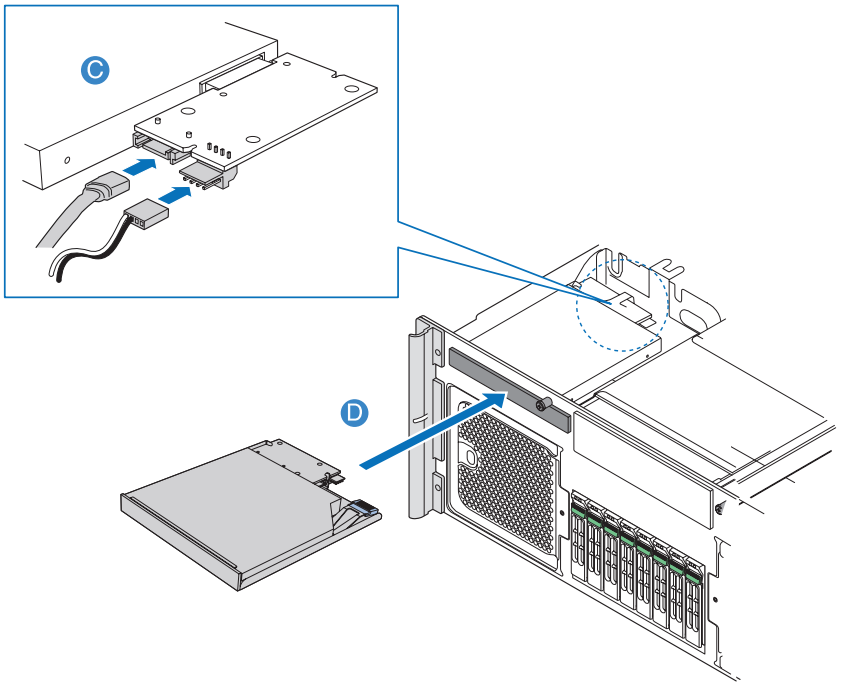
4 Attach the SATA-to-IDE converter board to the new media device **(A)**.

5 Install the media device into the carrier **(B)**.



6 Slide the carrier into the front opening in the chassis **(C)**.

7 Plug the SATA and power cables into the converter board **(D)**.



8 Observe the post-installation instructions described on page 40.

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Installing a 5.25-inch drive

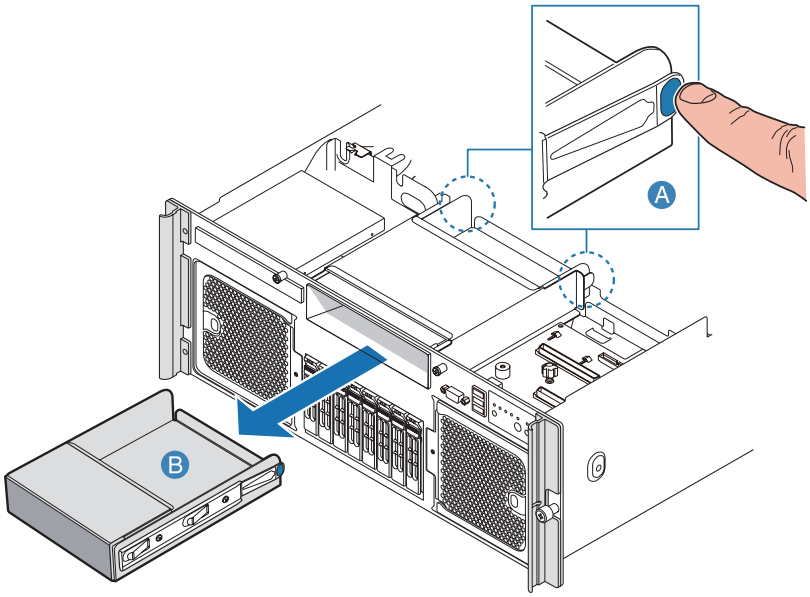
The 5.25-inch drive bay allows you to install a tape drive to provide the system with additional storage capacity.

To install a 5.25-inch drive:

1 Perform the pre-installation instructions described on page 39.

2 Push the tabs on both sides of the carrier filler panel **(A)**.

3 Hold the tabs in while pulling the carrier filler panel from the bay **(B)**.



4 Remove the screws that attach the slide rails to the filler panel.

5 Attach the slide rails to the device, then secure it with screws you removed earlier.

6 Attach the Y-power cable to the rear of the device.

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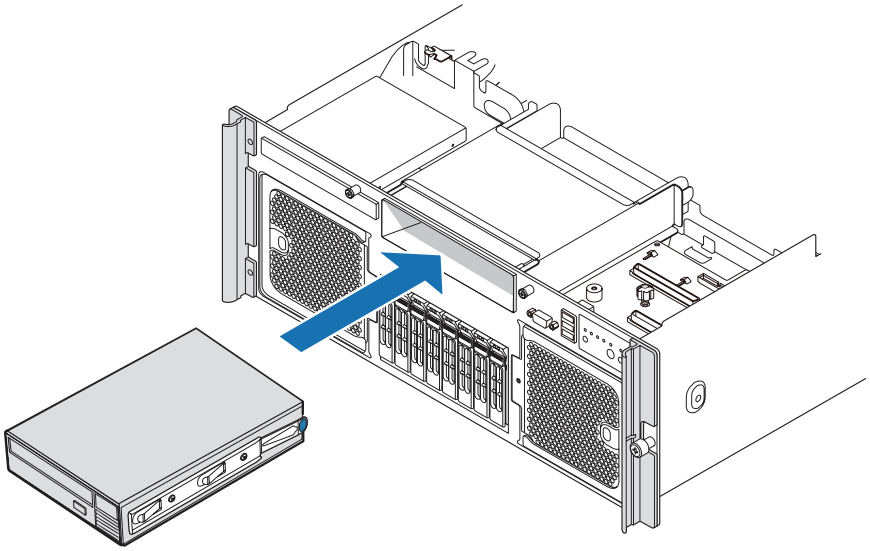
7 Slide the 5.25-inch peripheral device into the server until it clicks into place.



8 Observe the post-installation instructions described on page 40.

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Upgrading the processor

The server supports up to four processors, the following models are supported.

- Quad-core Intel Xeon processors 7300 series
- Dual-core Intel Xeon processors 7200 series

Processor configuration guidelines

Observe the following guidelines when replacing or installing a processor.

- Use only Acer-qualified processors.
- The CPU 1 socket must always be populated. If no processor is installed in this socket, the system will fail to boot.
- Before removing a processor, make sure to back up all important system files.
- When installing a second, third, or fourth processor, make sure it has same stepping and frequency specifications as the default processor.
- Handle the processor and the heatsink carefully. Damage to either may prevent the system from functioning properly.
- **Caution!** Make sure to install a processor thermal blank and a heat sink to replace the thermal blank. Only power on a system that has all four CPU sockets populated with heat sinks and/or thermal blanks.

To install a new processor:

1 Perform the pre-installation instructions described on page 39.

Warning! The heat sink becomes very hot when the system is on. NEVER touch the heat sink with any metal or with your hands.

2 If necessary, remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

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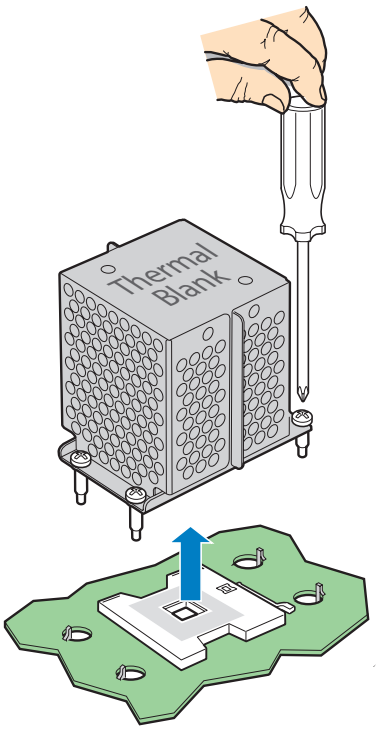
3 Remove the thermal blank.

(1) Loosen the four screws on the thermal blank.

(2) Pull the thermal blank away from the CPU socket.

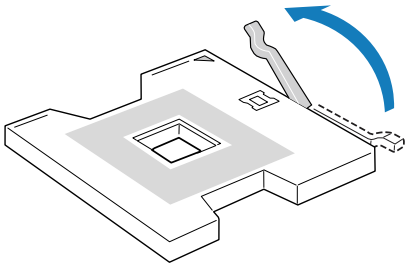


(3) Store the thermal blank in a protective bag.

4 Remove the new processor from its protective packaging.

5 Install the new processor.

(1) Pull the CPU socket retainer lever to a fully open position.



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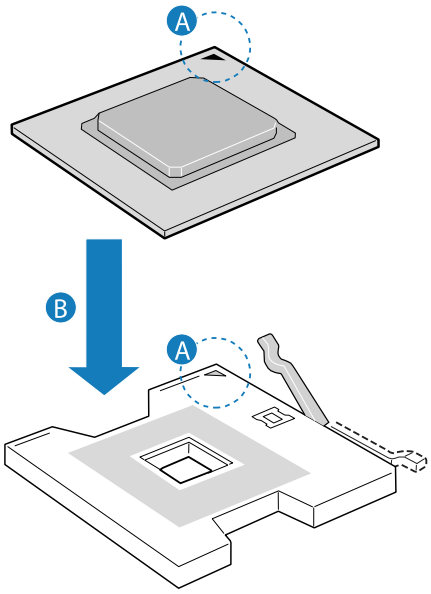
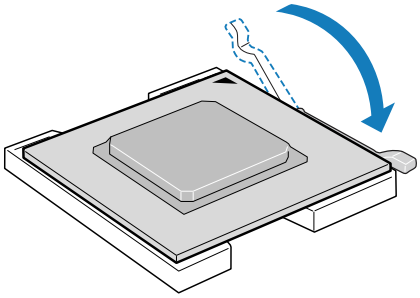
(2) Position the processor over the socket, matching the two triangle markers **(A)** and lining up the processor pins with the socket **(B)**.



(3) Press the retainer lever down to lock the processor in place.



6 Apply thermal grease.

Apply approximately 0.1 ml of the thermal grease compound to the top of the processor.

7 Install the heat sink.

(1) Set the heat sink on the processor, aligning the four screws in the heat sink with the screw sockets in the chassis.

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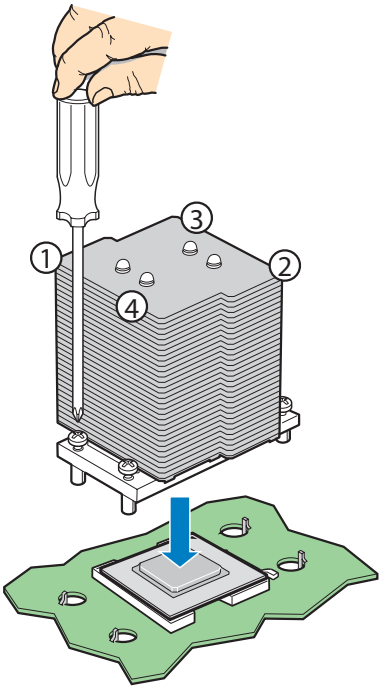
(2) Tighten the screws in the order shown, approximately one full turn at a time until each is evenly tightened. Do not fully tighten one screw at a time.



8 Observe the post-installation instructions described on page 40.

To remove a processor:

Important: Before removing a processor from the mainboard, make sure to create a backup file of all important data.

1 Perform the pre-installation instructions described on page 39.

Warning! The heat sink becomes very hot when the system is on. NEVER touch the heat sink with any metal or with your hands.

2 If necessary, remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

3 If a heatsink is installed, remove the heat sink.

(1) Loosen the four screws on the heat sink in the order shown.

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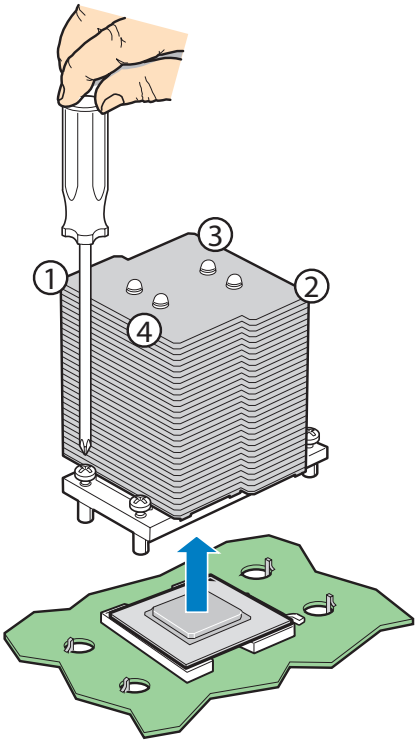
(2) Pull the heat sink away from the CPU socket.



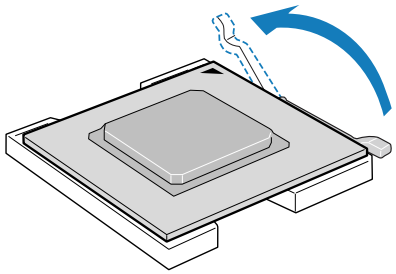
(3) Lay down the heat sink in an upright position—with the thermal patch facing upward. Do not let the thermal patch touch the work surface.

(4) Use an alcohol pad to wipe off the thermal grease from both the heat sink and processor.

4 Remove the processor.

Warning! The processor becomes very hot when the system is on. Allow it to cool off first before handling.

(1) Pull the CPU socket retainer lever to the fully open, upright position.



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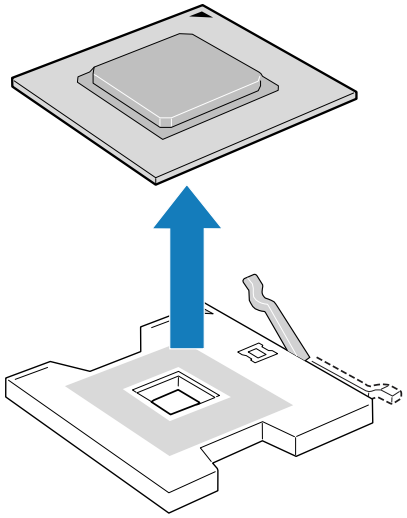
(2) Pull out the processor from the socket.



(3) Store it in an antistatic bag.

5 If you are not installing a new processor, reinstall the processor thermal blank to maintain proper airflow within the chassis.

6 If you going to install a new processor, perform instructions described in “To install a new processor” section.

7 Observe the post-installation instructions described on page 40.

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Removing and installing a memory board assembly

The server supports up to four memory boards. At least one memory board and two FBDIMMs must be installed for the server to function. Each memory board supports eight DIMM slots and a DIMM fault LED for each FBDIMM that is used to report DIMM failures and error conditions.

The supported memory board configurations are as follows.

- One memory board installed in memory board slot A, at the right side of the system.
- Two memory boards, installed in memory board slots A and B, the two boards at the right side of the system.
- All four memory boards, slots A, B, C, and D.

Important: Refer to the memory board installation order table on page 166 when installing and removing memory boards.

Caution! Damage to the system occurs if power is not removed from the system prior to removal or installation of memory boards.

To remove the memory board assembly:

Note: If you remove a memory board from the server, you must replace it with a replacement memory board.

1 Perform the pre-installation instructions described on page 39.

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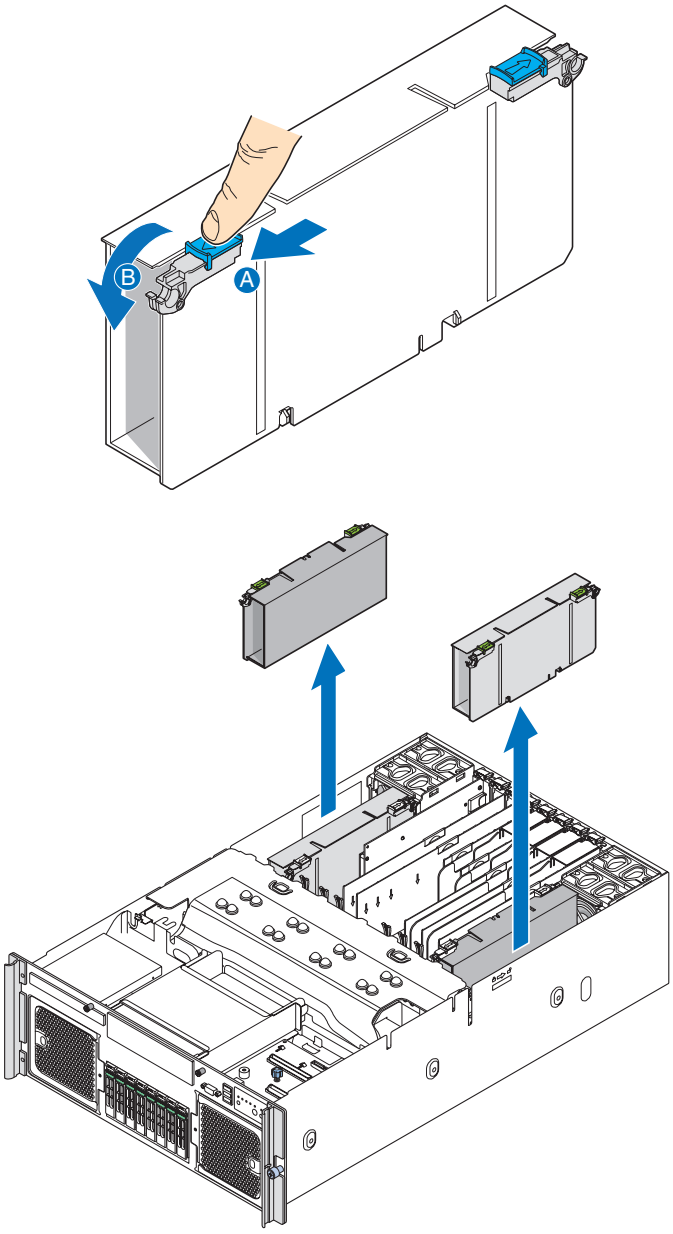
2 Lift the latches on the memory board to disengage the memory board from the mainboard **(A)**.

3 Lift the memory board by the latches **(B)**.



4 Observe the post-installation instructions described on page 40.

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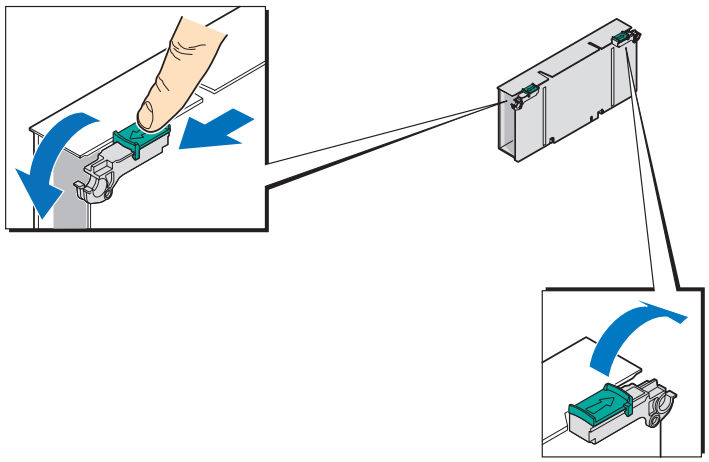
To install the memory board assembly:

1 Perform the pre-installation instructions described on page 39.

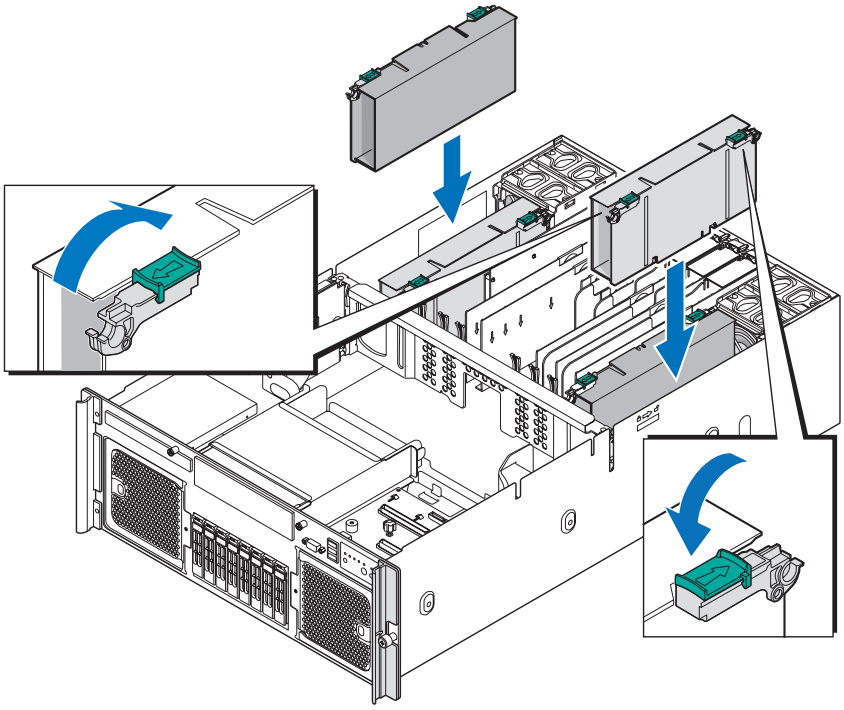
2 Locate an empty memory board slot.

3 Add or replace memory DIMMs as needed. For instructions, see “Installing and removing DIMM modules” section.

4 Lift the memory board latches to the fully open position.



5 Insert the memory board until latches are securely locked.



6 Observe the post-installation instructions described on page 40.

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Installing and removing DIMM modules

The server's memory board supports eight DIMM slots. Each slot supports 1 GB, 2 GB, and 4 GB DDR2-667 (PC2-5300) FBDIMM modules. The server's maximum memory capacity is 128 GB.

DIMM module configuration guidelines

Observe the following guidelines when replacing or installing DIMM modules to the memory boards.

- The system supports up to four memory boards. At least one memory board and two DIMMs must be installed for the server to function. Each memory board must have a minimum of two DIMMs installed.
- DIMMs must be installed in pairs. For example, DIMM slots 1 and 2, DIMM slots 3 and 4, DIMM slots 5 and 6, DIMM slots 7 and 8
- DIMMs in the same memory board must be identical in size, speed, and vendor.
- The system does not support mixed-sized DIMMs or DIMMs from different vendors within the same memory board.

Warning! Functionality issues may be encountered if mixed memory types are installed on the memory board.

- The system does not support combination of single-rank with dual-rank memory.
- Use only DDR2 FBDIMMs. Other type of DIMMs will not fit into the socket. Attempts to force a non-DDR2 FBDIMM into a socket will damage and/or the socket or the DIMM.
- Hold DIMMs only by the edges. Do not touch the components or gold edge connectors.
- Install DIMMs with gold-plated edge connectors only.

Important: Follow the DIMM module "FBDIMM module population order" section on page 167 when installing and removing DIMMs.

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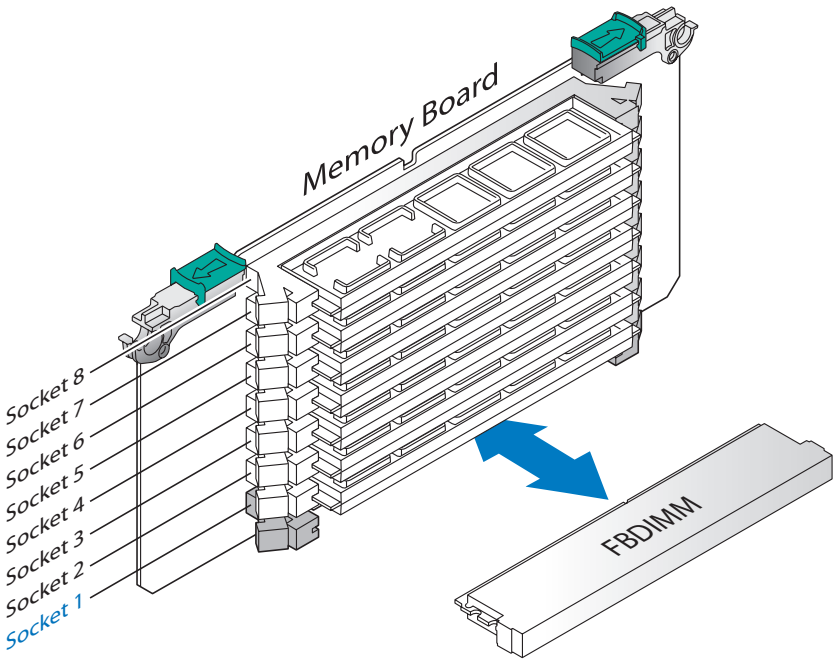
DIMM population guidelines

The following rules apply when adding DIMMs to the memory boards.

- DIMMs must be populated beginning with memory board A, DIMM slots A1 and A2.
- All DIMM slots must be populated with either a DIMM or a DIMM thermal blank.

Important: DIMM thermal blanks must be installed to *empty DIMM slots* to ensure proper system thermal performance.



- FBDIMMs should be identical in terms of timing, technology, and size.

Note: For additional memory configuration, see “Appendix B: Memory configuration” section on page 163.

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To install DIMMs in the memory board:

Caution! Use extreme care when installing a DIMM. Applying too much pressure can damage the connector. DIMMs are keyed and can be inserted in only one way.

Note: DIMM slots on the memory board must be installed only in certain configurations. Numbers next to DIMM slots correspond to installation sequence. DIMMs may be installed in pairs.

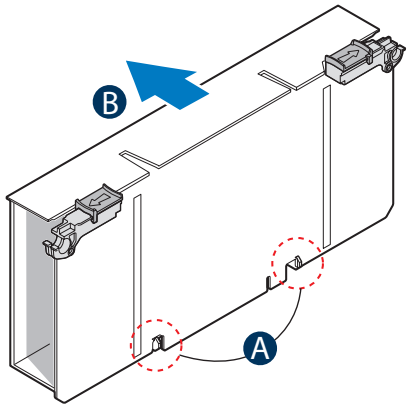
1 Perform the pre-installation instructions described on page 39.

2 Remove the memory board assembly. Perform the instructions described in "To install the memory board assembly" section on page 76.

3 Remove the DIMM cover from the memory board.

(1) Press down on the hooks on the underside of the memory board to disengage them **(A)**.

(2) Lift the DIMM cover from the memory board **(B)**.



4 Install DIMMs in the correct order. See "DIMM population guidelines" section on page 78.

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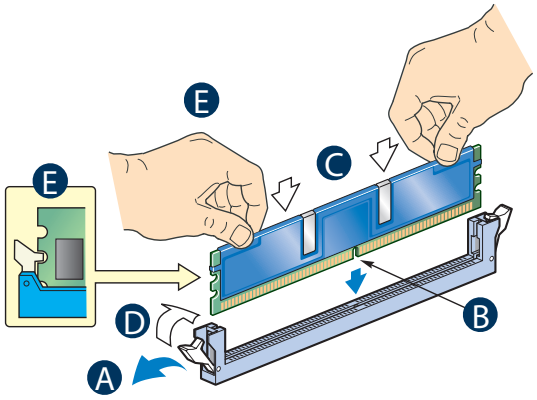
5 Open the clips on the DIMM slot(s) **(A)**.

6 Align **(B)** then insert the DIMM into the socket **(C)**.

7 Push down on the top edge of the DIMM. Make sure the holding clips lock the DIMM in place **(D)**.

8 Visually check that each latch is fully closed and correctly engaged with each DIMM slot **(E)**.

Note: The DIMM slot is slotted to ensure proper installation. If you insert a DIMM but it does not fit easily into the socket, you may have inserted it incorrectly. Reverse the orientation of the DIMM and insert it again.



9 Install the DIMM cover to the memory board.

(1) Lower the DIMM cover over the DIMM slots.

(2) Line up the hooks in the cover with the notches on the bottom edge of the memory board.

(3) Press the DIMM cover down until it clicks into place.

10 Install the memory board assembly. For instructions, see “To install the memory board assembly” section on page 76.

11 Observe the post-installation instructions described on page 40.

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To remove DIMMs on the memory board:

Before you can install a new DIMM in a socket, remove first any previously installed DIMM from that socket.

Important: Before removing any DIMM from the memory board, make sure to create a backup file of all important data.

Caution! Use extreme care when removing DIMMs. Too much pressure can damage the connector. Apply only enough pressure on the plastic levers to release the DIMM.

1 Perform steps 1 to 3 described in the "To install DIMMs in the memory board" section.

2 Press the holding clips on both sides of the DIMM slot outward to release the DIMM.

3 Gently pull the DIMM upward to remove it from the socket.

4 Install the memory board assembly. For instructions, see "To install the memory board assembly" section on page 76.

5 Observe the post-installation instructions described on page 40.

To reconfigure the system memory:

The system automatically detects the amount of memory installed. Run the BIOS setup to view the new value for total system memory and make a note of it.

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Removing and installing a non-hot-plug PCI card

PCI cards installed in slots 1 and 2 are hot-pluggable. If you are adding or removing a card from one of these slots, you can do so without powering down the server. For information, refer to page 59.

To remove a non-hot-plug PCI card:

Caution! Damage to the system occurs if power is not removed from the system prior to removal or installation of non-hot-plug boards.

1 Perform the pre-installation instructions described on page 39.

2 Disconnect any cables attached to the PCI card.

3 Perform steps 5 through 10 described in the "To remove a hot-plug PCI card with OS hot-plug interface" section on page 59.

To install a non-hot-plug PCI card:

1 Perform the pre-installation instructions described on page 39.

2 Perform steps 2 to 8 described in the "To install a new hot-plug PCI card" section on page 62.

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Configuring server management components

Altos R920 system provides an upgrade path to advanced server management capabilities through installation of the following components.

- I/O expansion module
- ARMC/3 R2 module

Installing and removing the I/O expansion module

The optional I/O expansion module is a vertical riser with a dedicated management Ethernet port, and additional dual-gigabit Ethernet ports.

To install the I/O expansion module:

1 Perform the pre-installation instructions described on page 39.

2 Rotate the retention latch on the rear of the card slot upward **(A)**.

3 Pull up the slot cover **(B)**.

4 Remove the board from its protective packaging.

5 Align the board in the empty slot **(C)**.

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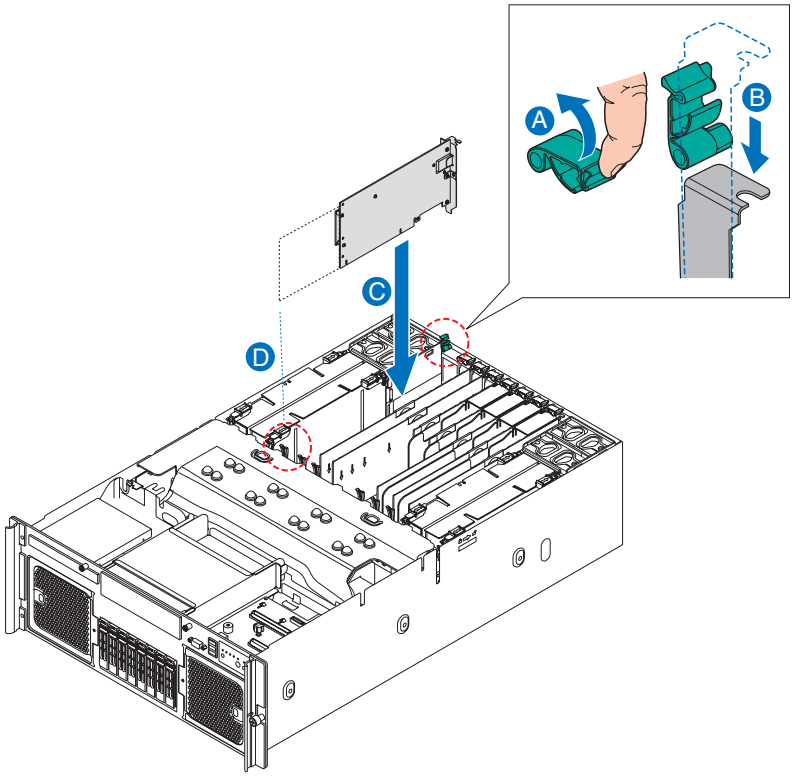
6 Insert the module into the I/O expansion module slot on the mainboard. Make sure that the card is properly seated **(D)**.



7 Rotate the retention latch downward.

8 Observe the post-installation instructions described on page 40.

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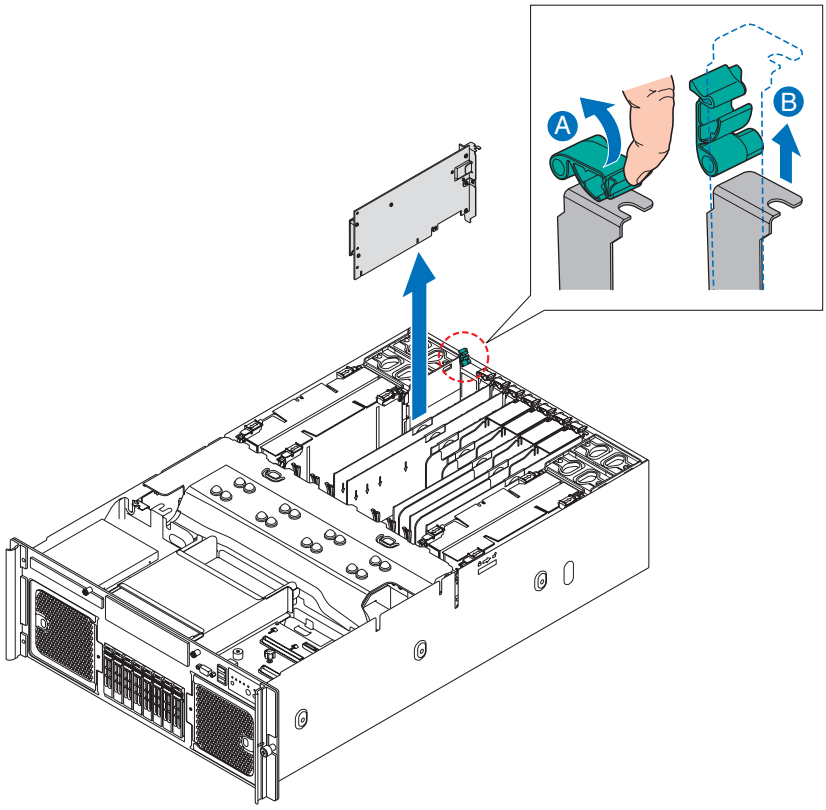
To remove the I/O expansion module:

1 Perform the pre-installation instructions described on page 39.

2 Rotate the retention latch on the rear of the I/O expansion module slot upward **(A)**.

3 Pull the board away from the chassis **(B)**.



4 Store the board in an antistatic bag.

5 Observe the post-installation instructions described on page 40.

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Installing and removing the ARMC/3 R2 module

The optional ARMC/3 R2 module provides server management firmware and functionality for the system.

To install the ARMC/3 R2 module:

1 Perform the pre-installation instructions described on page 39.

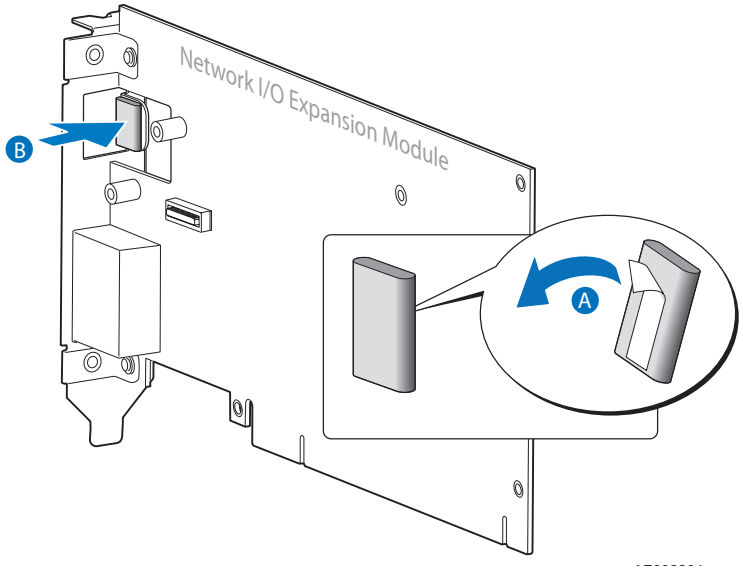
2 Remove the I/O expansion module. Perform instructions described in “To remove the I/O expansion module” section on page 85.

3 Set the I/O expansion module on a static controlled surface with components facing up.

4 Record the MAC address on the ARMC/3 R2 module.

5 Peel off the backing from the EMI gasket **(A)**.

6 Adhere the gasket to the I/O expansion module where the ARMC/3 R2 NIC module will contact the I/O expansion module **(B)**.



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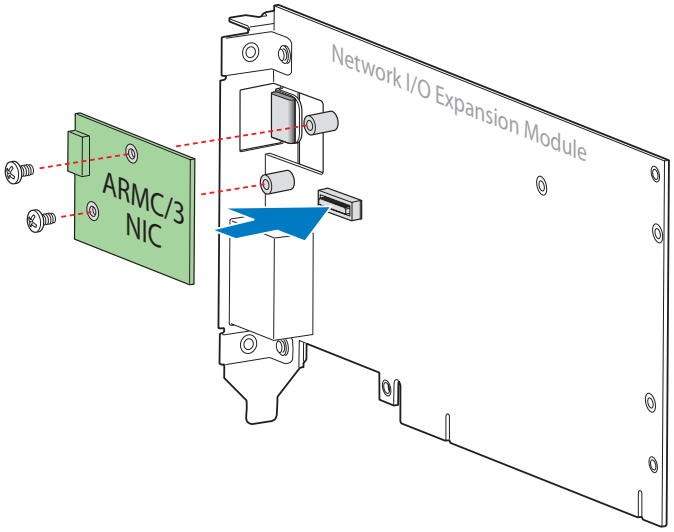
7 Install the ARMC/3 R2 NIC module.

(1) Attach the ARMC/3 R2 NIC module to the I/O expansion module.

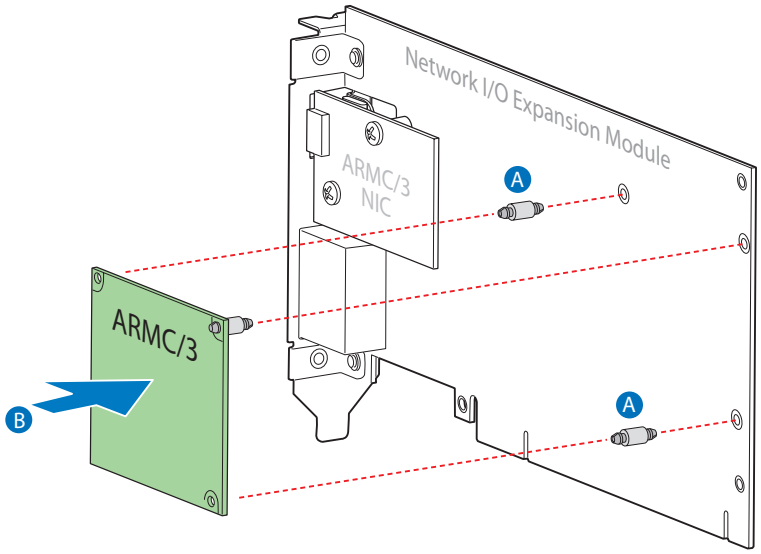
(2) Secure the ARMC/3 R2 NIC module to the I/O expansion module with the two screws provided.



8 Install the ARMC/3 R2 module.

(1) Insert the standoff into the hole in the ARMC/3 R2 module **(A)**. The standoff installs on the bottom side of the module.

(2) Attach the module to the module connector on the I/O expansion module and snap the standoff into the matching hole on the I/O module **(B)**.



9 Install the I/O expansion module. Perform instructions described on “To install the I/O expansion module” section.

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10 Observe the post-installation instructions described on page 40.

To remove the ARMC/3 R2 module:

1 Perform the pre-installation instructions described on page 39.

2 Remove the I/O expansion module. Perform instructions described in “To remove the I/O expansion module” section on page 85.

3 Set the I/O expansion module on a static controlled surface with components facing up.

4 Remove the ARMC/3 R2 NIC module.

   (1) Remove the three screws on the ARMC/3 R2 NIC module.

   (2) Pull the ARMC/3 R2 NIC module to remove it.

5 Remove the ARMC/3 R2 module.

   (1) Pull up the ARMC/3 R2 module to remove it from the connector.

   (1) Remove the three standoffs from the mainboard, then keep the standoffs for later installation.

6 Observe the post-installation instructions described on page 40.

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Configuring the hardware RAID components

Altos R920 system supports SAS hardware RAID through installation of of a SAS module. With the addition of the following components to the SAS module enhanced RAID capability is enabled.

- RAID activation key
- RAID cache
- RAID BBU (battery backup unit)

Installing and removing the SAS module

The SAS module works with the SAS backplane board to support eight SAS hard drives. The SAS module supports RAID levels 0, 1, 1a, and 10 without any additional components.

To install the SAS module:

1 Perform the pre-installation instructions described on page 39.

2 Remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

3 Remove the SAS module from its protective packaging.

4 If you want to install a RAID activation key, RAID cache, RAID BBU on the adapter, refer to succeeding sections for instructions.

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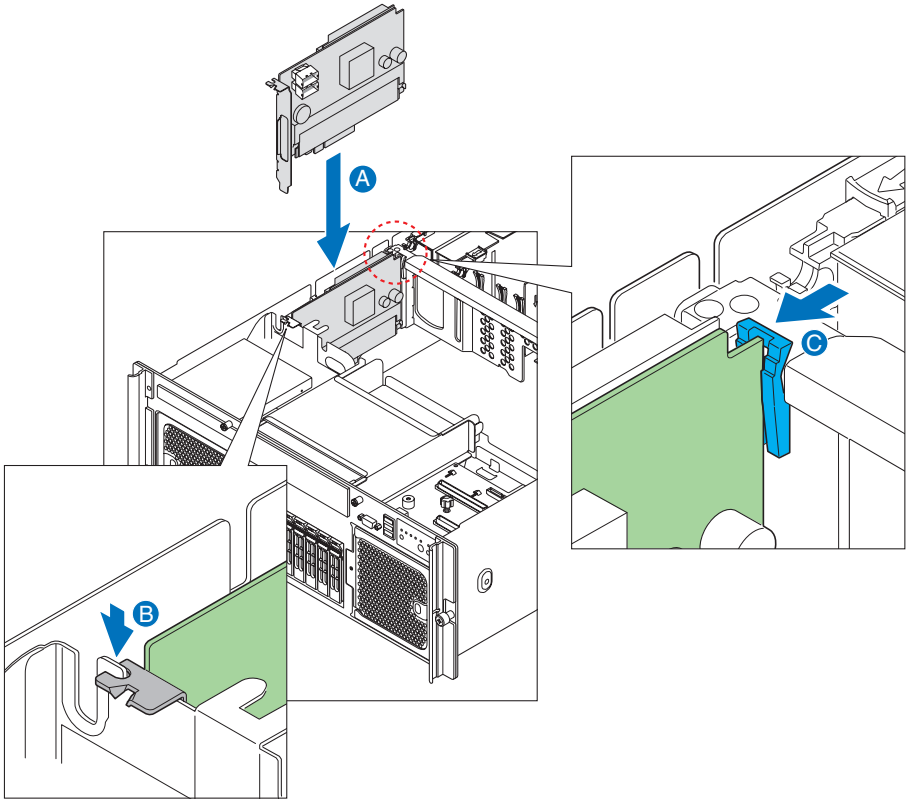
5 Align then insert the SAS module in the SAS module slot on the mainboard. Make sure that the edge of the card is properly seated **(A)**.

6 Press down on the card until the metal bracket on the card is flush with the chassis **(B)** and locks into place **(C)**.



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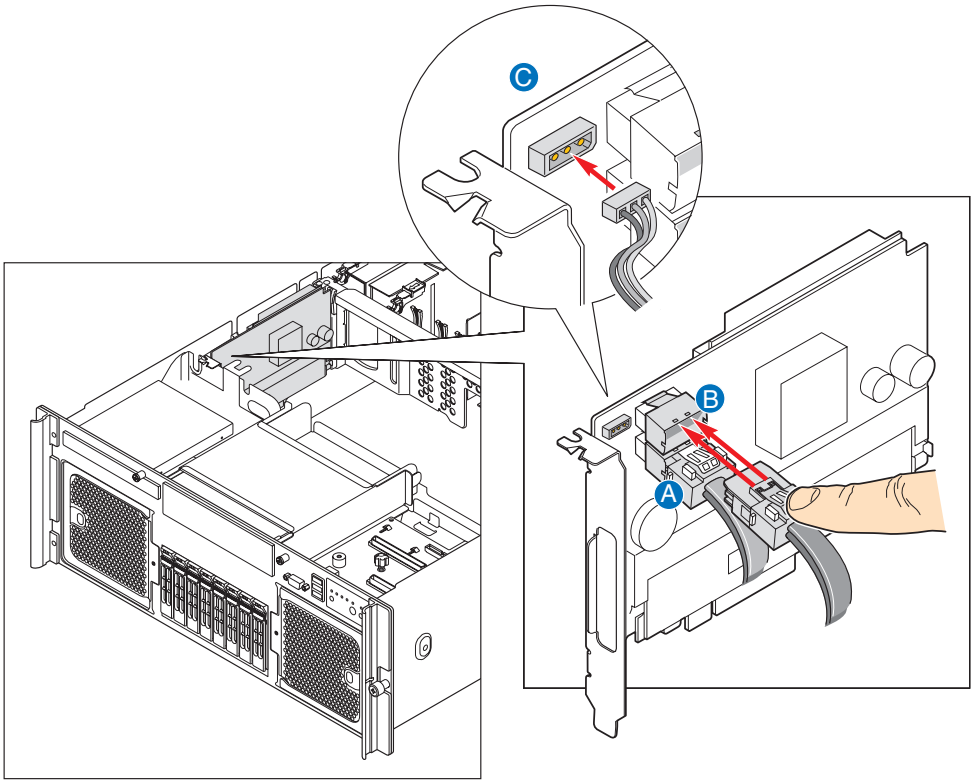
7 Attach the SAS expander cables to the SAS connector A **(A)** and the SAS connector B **(B)** on the adapter.

8 Attach the SES cable to the SES connector on the SAS module **(C)**.



9 Observe the post-installation instructions described on page 40.

To remove the SAS module:

1 Perform the pre-installation instructions described on page 39.

2 Remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

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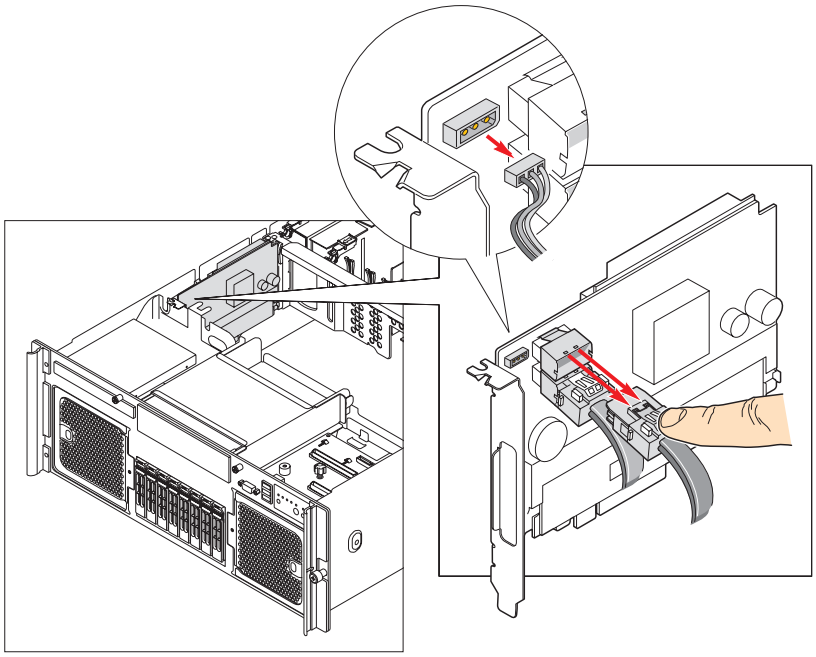
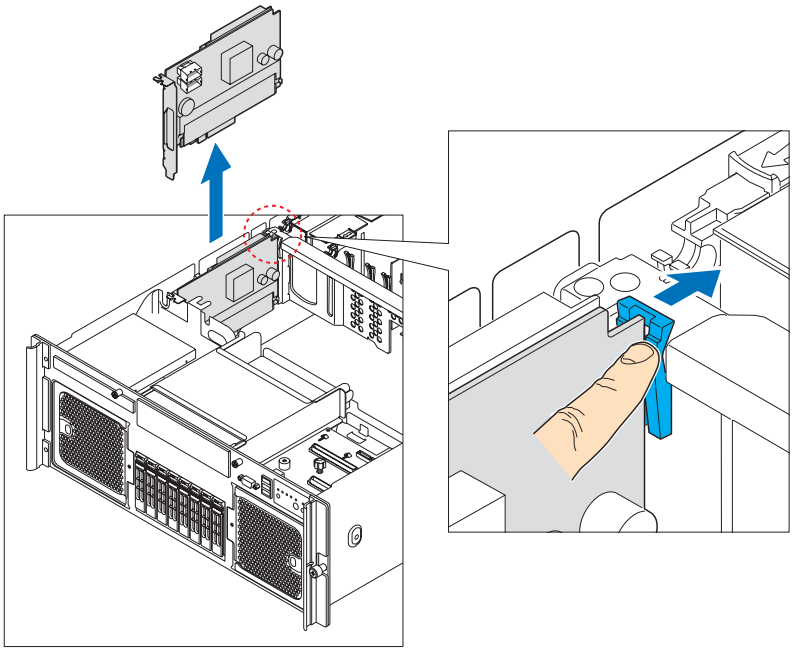
3 Disconnect any cables attached to the SAS module.



4 While pushing back on the slot divider latch, pull the SAS module away from the chassis.



5 Store the card in an antistatic bag.

6 Observe the post-installation instructions described on page 40.

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Installing and removing the RAID activation key and RAID cache

The optional RAID activation key and RAID cache enables enhanced RAID functionality on the SAS module. The RAID cache serves as memory for the SAS controller, and as a disk cache to store write data to the drives. The RAID cache must be a 512 MB DDR2-667 DIMM.

To install the RAID activation key and RAID cache:

1 Perform the pre-installation instructions described on page 39.

2 Remove the processor air baffle. Perform instructions described in "To remove the processor air baffle" section on page 45.

3 Remove the SAS module. Perform instructions described in "To install the SAS module" section on page 89.

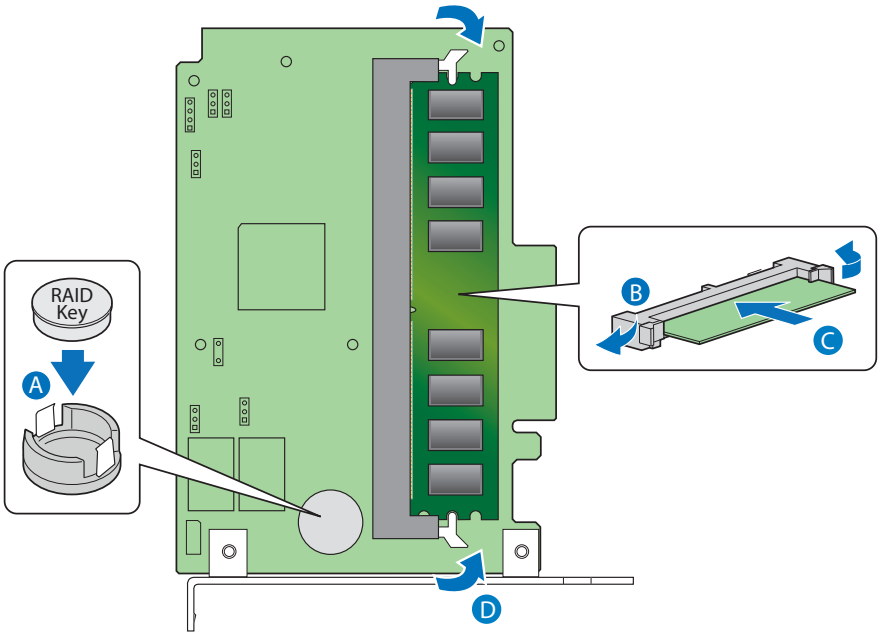
4 Remove the RAID activation key from its protective packaging.

5 Align then insert the activation key into the RAID activation key connector on the SAS module **(A)**.

6 Open the clips on the RAID cache slot on the SAS module **(B)**.

7 Align then insert the RAID cache into the slot **(C)**.

8 Push down on the top edge of the RAID cache until the holding clips snap in place **(D)**.



9 Observe the post-installation instructions described on page 40.

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To remove the RAID activation key and RAID cache:

1 Perform the pre-installation instructions described on page 39.

2 Remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

3 Remove the SAS module. Perform instructions described in “To remove the SAS module” section on page 89.

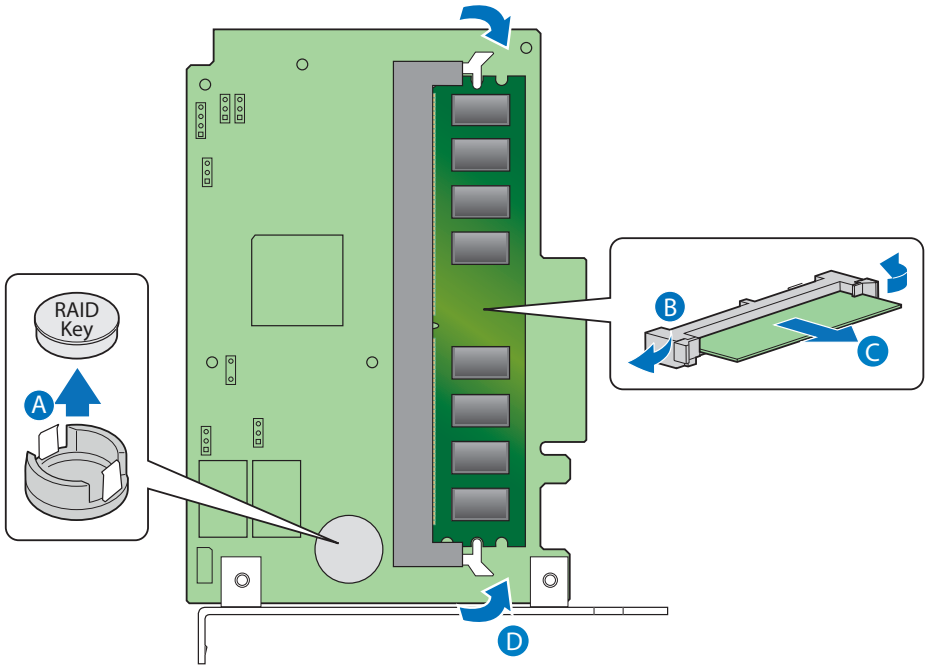
4 Insert the tip of a small flat-bladed screwdriver under the plastic tab on the retainer holding the activation key to the mainboard.

5 Gently push down to detach the activation key **(A)**.

6 Press the holding clips on both sides of the slot outward to release the RAID cache **(B)**.

7 Gently pull the RAID cache upward to remove it from the slot **(C)**.

8 Close the clips **(D)**.



9 Observe the post-installation instructions described on page 40.

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Installing and removing the RAID BBU

If power to the SAS controller on the SAS module drops below specifications, the optional RAID BBU maintains the contents of the DIMM by keeping the cache in self-refresh mode until power is restored. After power is restored, the data is safely written to the drives, maintaining the integrity of the disk array.

To install the RAID BBU:

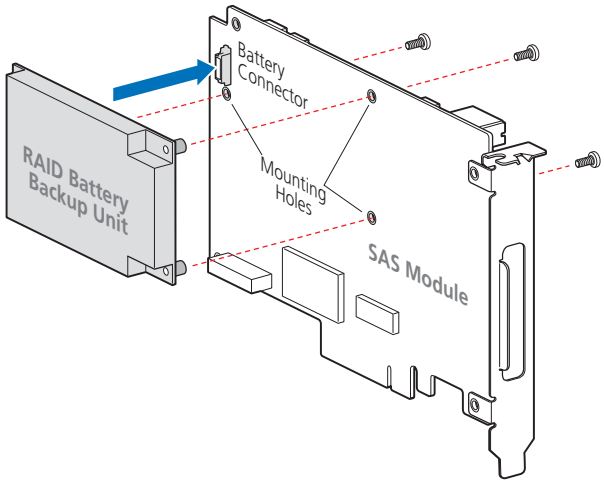
1 Perform the pre-installation instructions described on page 39.

2 Remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

3 Remove the SAS module. Perform instructions described in “To remove the SAS module” section on page 89.

4 Align then insert the RAID BBU into the battery connector on the SAS module.

5 Secure the RAID BBU with the three screws provided.



6 Observe the post-installation instructions described on page 40.

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To remove the RAID BBU:

1 Perform the pre-installation instructions described on page 39.

2 Remove the processor air baffle. Perform instructions described in “To remove the processor air baffle” section on page 45.

3 Remove the SAS module. Perform instructions described in “To remove the SAS module” section on page 89.

4 Remove the three screws on the RAID BBU.

5 Remove the RAID BBU from the SAS module.

6 Observe the post-installation instructions described on page 40.

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4 System BIOS

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This chapter gives information about the system BIOS and discusses how to configure the system by changing the settings of the BIOS parameters.

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BIOS overview

The Aptio Setup Utility is a hardware configuration program built into the system's Basic Input/Output System (BIOS). Since most systems are already properly configured and optimized, there is no need to run this utility. You will need to run this utility under the following conditions.

- When changing the system configuration settings
- When redefining the communication ports to prevent any conflicts
- When changing the password or making other changes to the security settings
- When a configuration error is detected by the system and you are prompted ("Run Setup" message) to make changes to the BIOS setup

Note: If you repeatedly receive Run Setup messages, the battery may be bad. In this case, the system cannot retain configuration values in CMOS. Ask a qualified technician for assistance.

BIOS setup loads the configuration values in a battery-backed nonvolatile memory called CMOS RAM. This memory area is not part of the system RAM which allows configuration data to be retained when power is turned off.

Before you run BIOS setup, make sure that you have saved all open files. The system reboots immediately after you close the Setup.

Note: Aptio Setup Utility will be simply referred to as “BIOS setup”, “Setup”, “System BIOS” or “Setup Utility” in this guide.

The screenshots used in this guide display default system values. These values may not be the same as those found in the system.

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Entering BIOS setup

Power on the server to start the system POST process. During bootup, press **F2** to enter the BIOS setup screen.

Note: You must press **F2** while the system is booting. This key does not work during any other time.

BIOS setup menus

There are several tabs on the setup screen corresponding to the eight primary BIOS menus.

- Main
- Advanced
- Security
- Server Management
- Boot Options
- Boot Manager
- Error Manager
- Exit

In the descriptive table following each of the screen illustrations, settings in **boldface** are the default and suggested parameter settings.

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BIOS setup keyboard commands

Use the following commands to navigate through the Setup Utility.

- **Left** and **Right** arrow keys - Move between selections on the menu bar.
- **Up** and **Down** arrow keys - Move the cursor to select an item.
- **+** and **-** keys - Press the keys to scroll through drop down list values in ascending or descending order without displaying the full list.

  Note: Grayed-out items have fixed settings and are not user-configurable.

- **Esc** key - If you press this key:
  - While a drop-down list is displayed, the primary menu displays.
  - While a sub-menu is displayed, the submenu is closed and the primary menu displays.
  - On one of the primary menu screens, the Exit menu displays.
- **Enter** key - Display a submenu screen as well as drop-down lists.

  Note: When a parameter is preceeded by a [**>**], it means that a submenu screen is available.

- **F9** key - Load the default configuration.
- **F10** key - Save changes made and close the BIOS setup.

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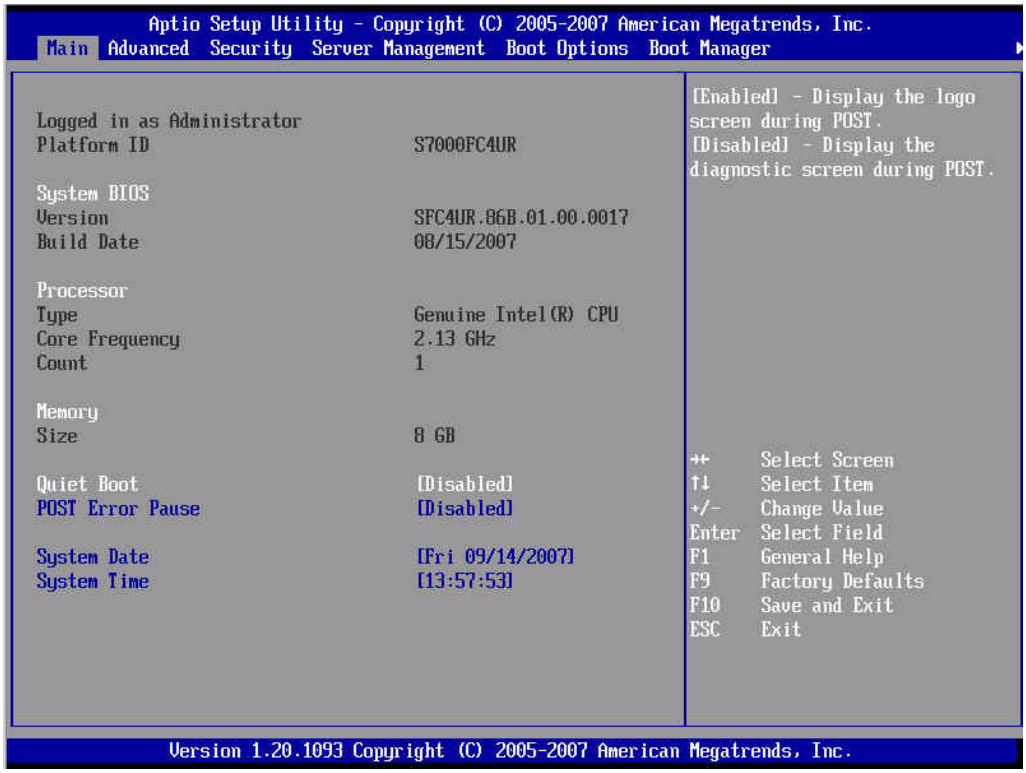
Main menu

The Main menu displays basic and important information about the system. These information are necessary for troubleshooting and may be required when asking for technical support. These entries are for your reference only and are not user-configurable.



Parameter	Description	Option
Logged in as <Administrator/ User>	Displays the security account used to enter the Setup Utility.	
Platform ID	Displays the system name.	
System BIOS		
Version	Version of the BIOS.	
Build Date	Date BIOS was created.	

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Parameter	Description	Option
Processor		
Type	Specification of the processor currently installed in the server.	
Core Frequency	Processor clock speed in GHz or MHz.	
Count	Number of processors currently installed in the server.	
Memory		
Size	Total size of system memory detected during POST.	
Quiet Boot	When enabled, the BIOS splash screen displays during startup. When disabled, the diagnostic screen displays during startup.	Enabled **Disabled**
POST Error Pause	When enabled, the system will enter the Error Manager for critical POST errors. When disabled, the system will continue to boot bypassing the Error Manager for critical POST errors.	Enabled **Disabled**
System Date	Sets the date following the month-day-year format. Valid values for weekday, month, day, and year are: Month: 1 to 12 Day: 1 to 31 Year: 1998 to 2099	
System Time	Sets the time following the hour-minute-second format. Valid values for hour, minute, and second are: Hour: 00 to 23 Minute: 00 to 59 Second: 00 to 59	

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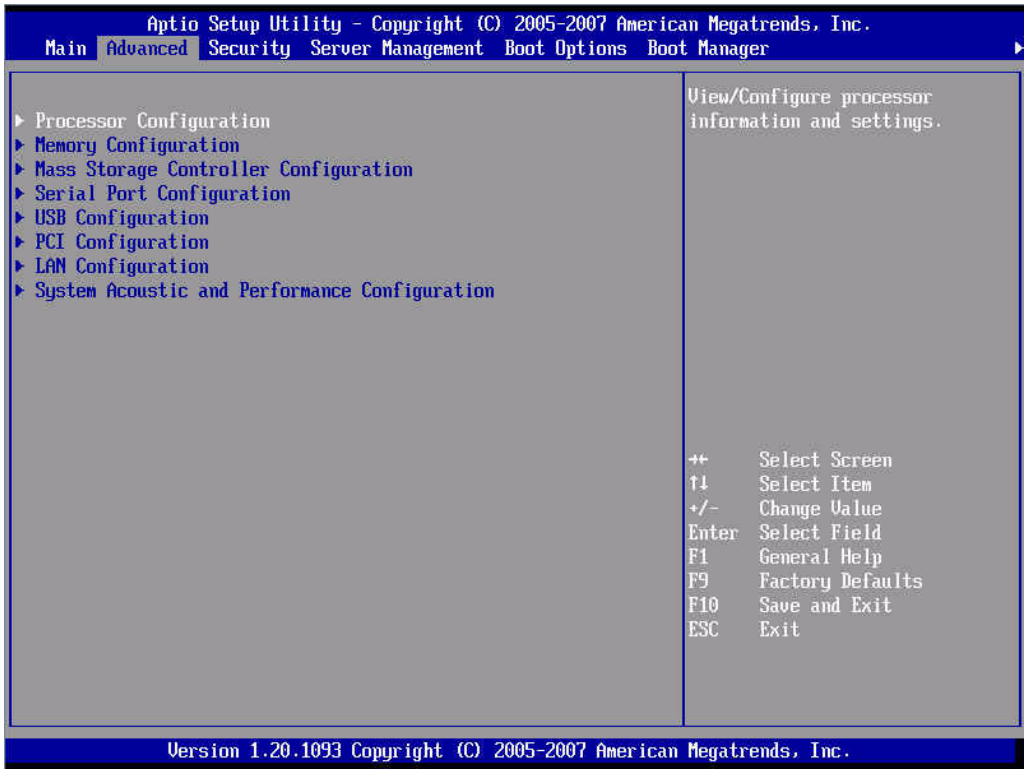
Advanced menu

The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press **Enter** to enter to access the related submenu screen.



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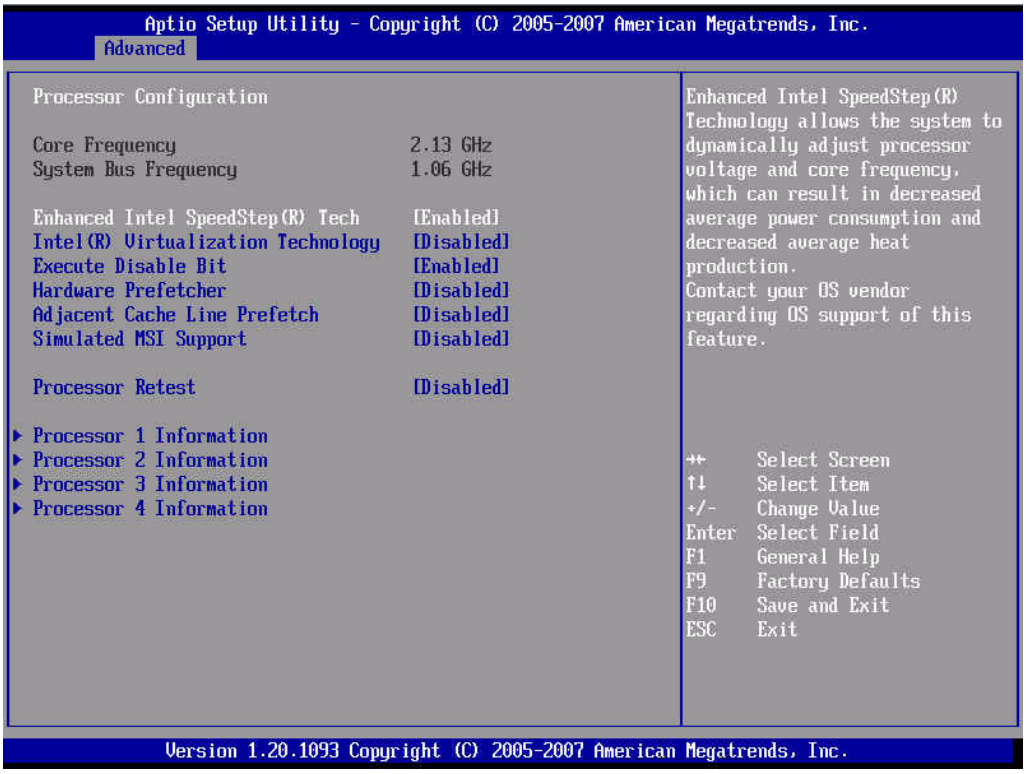
Processor Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
Processor Configuration
Core Frequency 2.13 GHz
System Bus Frequency 1.06 GHz
Enhanced Intel SpeedStep(R) Tech [Enabled]
Intel(R) Virtualization Technology [Disabled]
Execute Disable Bit [Enabled]
Hardware Prefetcher [Disabled]
Adjacent Cache Line Prefetch [Disabled]
Simulated MSI Support [Disabled]
Processor Retest [Disabled]
Processor 1 Information
Processor 2 Information
Processor 3 Information
Processor 4 Information
Enhanced Intel SpeedStep(R) Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.
Contact your OS vendor regarding OS support of this feature.
Select Screen
Select Item
Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Core Frequency	Frequency at which the processors currently run in.	
System Bus Frequency	Frequency of the processor front side bus.	
Enhanced Intel SpeedStep Tech	When enabled, this feature allows the OS to reduce power consumption. When disabled, the system operates at maximum processor speed.	**Enabled** Disabled
Intel (R) Virtualization Technology	Enables or disables the system to run multiple operating systems and applications in different partition.	Enabled **Disabled**
Execute Disable Bit	Enables or disables the execute disable bit to prevent certain classes of malicious buffer overflow attacks.	**Enabled** Disabled
Hardware Prefetcher	Enables or disables the processor Hardware Prefetch feature.	**Enabled** Disabled

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Parameter	Description	Option
Adjacent Cache Line Prefetch	When enabled, cache lines are fetched in pairs (even line + odd line). When disabled, only the current cache line required is fetched.	**Enabled** Disabled
Simulated MSI Support	Enables or disables the simulation of Message Signal Interrupt (MSI) support. **Note:** This feature can be enabled in the case where there is no OS support for MSI.	Enabled **Disabled**
Processor Retest	When an error message associated with the processor occurs during POST, you can enable this parameter to eliminate the error message.	Enabled **Disabled**
Processor <n> Information	Displays information about the system processor, such as family or generation, frequency supported, cache size, stepping number, and processor ID register value. Press **Enter** to access the Processor # Information submenu.	

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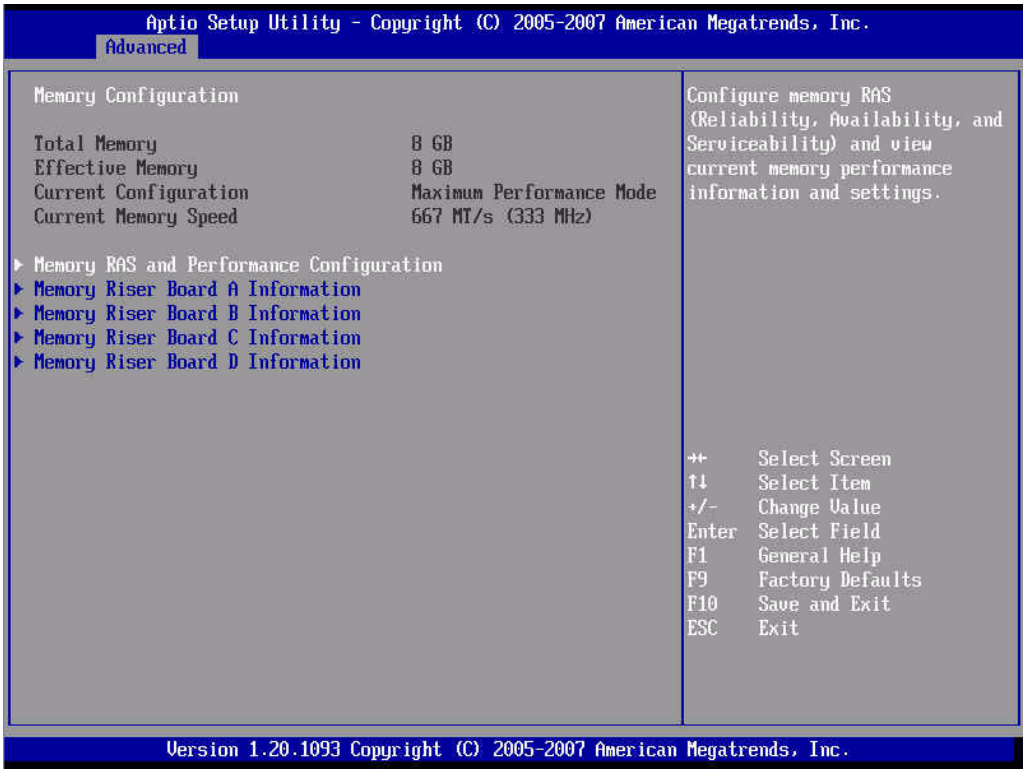
Memory Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
Memory Configuration
Total Memory 8 GB
Effective Memory 8 GB
Current Configuration Maximum Performance Mode
Current Memory Speed 667 MT/s (333 MHz)
Memory RAS and Performance Configuration
Memory Riser Board A Information
Memory Riser Board B Information
Memory Riser Board C Information
Memory Riser Board D Information
Configure memory RAS (Reliability, Availability, and Serviceability) and view current memory performance information and settings.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description
Total Memory	Total amount of onboard memory in MB or GB. The memory size is automatically detected by BIOS during the POST. If you install additional memory, the system automatically adjusts this parameter to display the new memory size.
Effective Memory	Amount of memory available to the operating system in MB or GB.

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Parameter	Description
Current Configuration	Displays either one of the following memory configuration: • Maximum performance mode - System memory is configured for optimal performance and efficiency. No RAS features are enabled. • Single channel mode - System memory is functioning in a reduced efficiency fail-safe mode. • Memory mirroring mode - System memory is configured for maximum reliability in the form of memory mirroring. • Dual-DIMM sparing mode - System memory is configured for optimal performance and efficiency. Sparing is also enabled.
Current Memory Speed	Displays the speed the memory is currently running at 533 MT/s (266 MHz) or 667 MT/s (333 MHz).
Memory RAS and Performance Configuration	Customize several memory configuration options, such as whether to use memory mirroring or memory sparing. Press **Enter** to access the Memory RAS and Performance Configuration submenu.
Memory Riser Board <n> Configuration	Displays details about the memory boards and associated FBDIMMs installed. Press **Enter** to access the Memory Riser Board <n> Configuration submenu.

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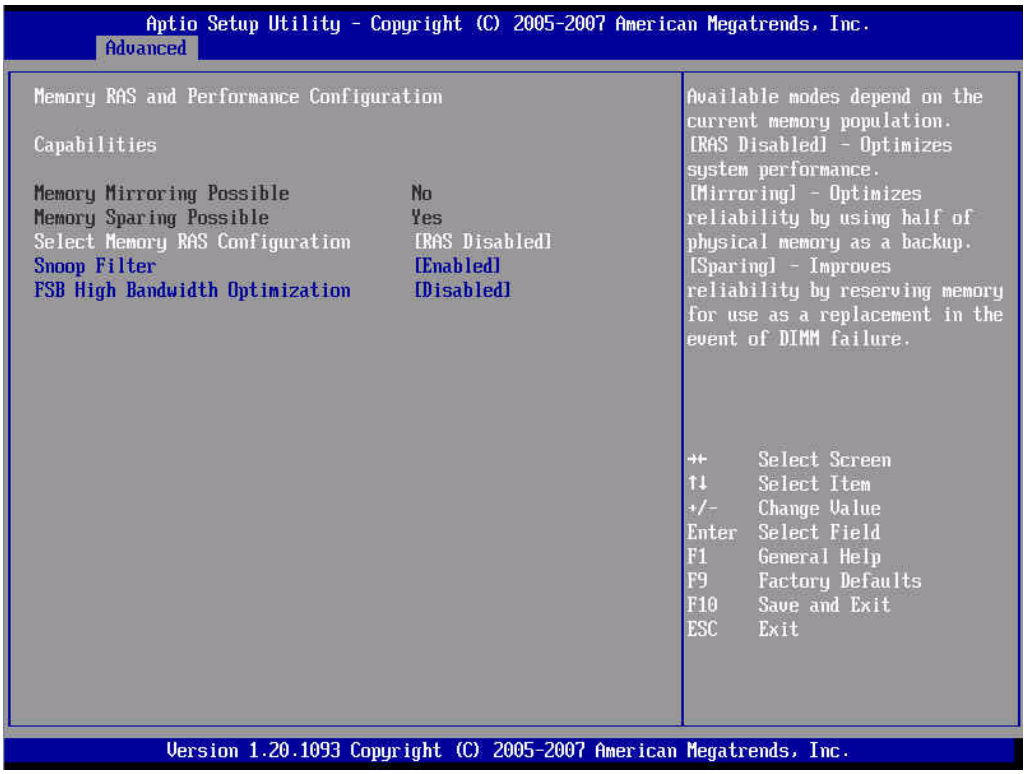
Memory RAS and Performance Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
Memory RAS and Performance Configuration
Capabilities
Memory Mirroring Possible No
Memory Sparing Possible Yes
Select Memory RAS Configuration [RAS Disabled]
Snoop Filter [Enabled]
FSB High Bandwidth Optimization [Disabled]
Available modes depend on the current memory population.
[RAS Disabled] - Optimizes system performance.
[Mirroring] - Optimizes reliability by using half of physical memory as a backup.
[Sparing] - Improves reliability by reserving memory for use as a replacement in the event of DIMM failure.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Memory Mirroring Possible	Indicates if system memory is configured for memory mirroring.	Yes/No
Memory Sparing Possible	Indicates if system memory is configured for memory sparing.	Yes/No
Select Memory RAS Configuration	Provides options for configuring Memory RAS. The possible options for this menu item are: • RAS Disabled - Normal mode of operation. • Sparing - Improves reliability by reserving memory for use as a replacement in the event of DIMM failure. • Mirroring - Optimizes reliability by using half of physical memory as a backup.	**RAS Disabled** Sparing Mirroring

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Parameter	Description	Option
Snoop Filter	The Snoop Filter component monitors and controls the data transactions between memory and the processor.	**Enabled** Disabled
FSB High Bandwidth Optimization	Enables or disables optimize front side bus for higher bandwidth when 1333 MHz FSB processor(s) is installed. **Note:** Some applications will benefit with this option enabled. Configure based on performance result.	Enabled **Disabled**

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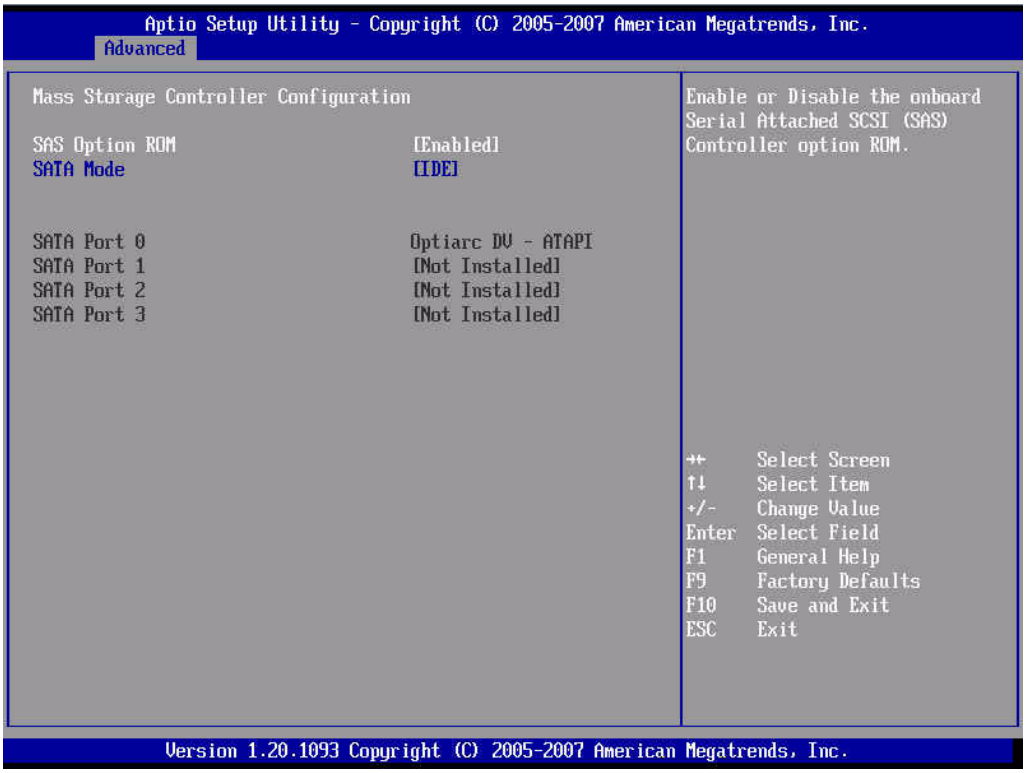
Mass Storage Controller Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
Mass Storage Controller Configuration
SAS Option ROM [Enabled]
SATA Mode [IDE]
SATA Port 0 Optiarc DV - ATAPI
SATA Port 1 [Not Installed]
SATA Port 2 [Not Installed]
SATA Port 3 [Not Installed]
Enable or Disable the onboard Serial Attached SCSI (SAS) Controller option ROM.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
SAS Option ROM	Enables or disables the onboard SAS controller option ROM.	**Enabled** Disabled
SATA Mode	When set to IDE, system supports up to 4 SATA ports with Parallel ATA emulation. When set to AHCI, system supports all SATA ports using the Advanced Host Controller interface. When set to SW RAID, system supports configuration of SATA ports for RAID via RAID configuration software.	**IDE** AHCI SW RAID
SATA Port 0, 1, 2, 3, 4, 5	Indicates information for the device connected to the SATA connector.	

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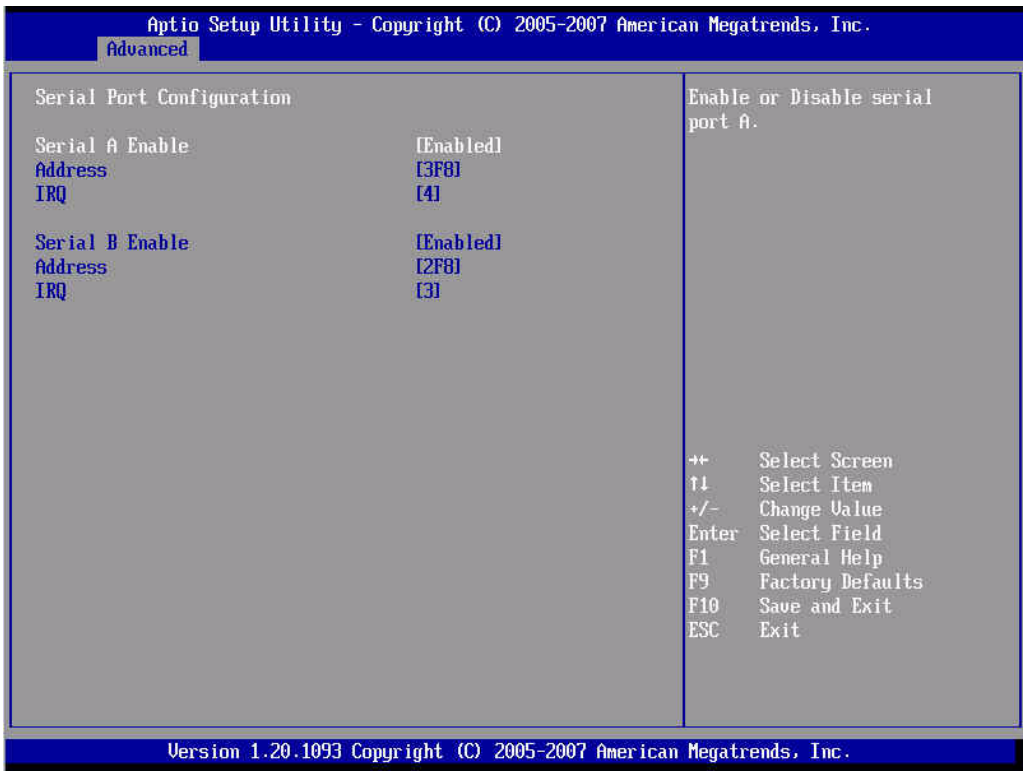
Serial Port Configuration



Parameter	Description	Option
Serial A Enable	Enables or disables the onboard serial A port.	**Enabled** Disabled
Address	Set the base I/O address for serial A port.	**3F8** 2F8 2E8 3E8
IRQ	Set the interrupt request line for the serial A port.	**4** 3
Serial B Enable	Enables or disables the onboard serial B port.	**Enabled** Disabled
Address	Set the base I/O address for serial B port.	**2F8** 3F8 2E8 3E8

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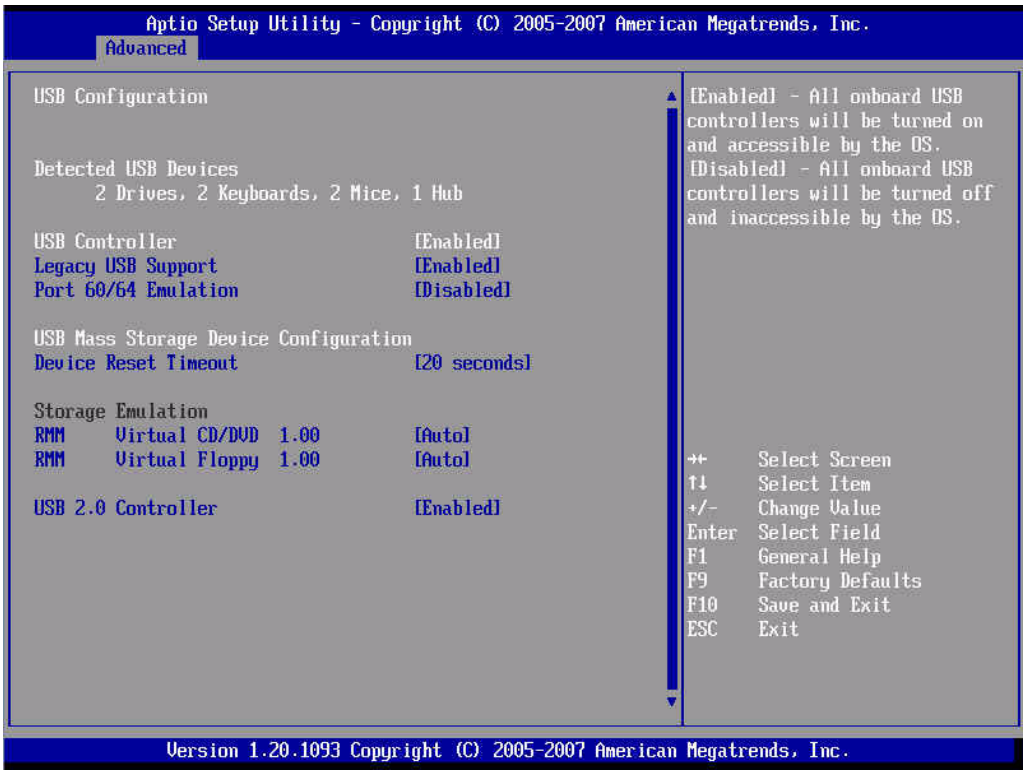
Parameter	Description	Option
IRQ	Set the interrupt request line for the serial B port.	**3** 4

USB Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
USB Configuration
Detected USB Devices
2 Drives, 2 Keyboards, 2 Mice, 1 Hub
USB Controller [Enabled]
Legacy USB Support [Enabled]
Port 60/64 Emulation [Disabled]
USB Mass Storage Device Configuration
Device Reset Timeout [20 seconds]
Storage Emulation
RMM Virtual CD/DVD 1.00 [Auto]
RMM Virtual Floppy 1.00 [Auto]
USB 2.0 Controller [Enabled]
[Enabled] - All onboard USB controllers will be turned on and accessible by the OS.
[Disabled] - All onboard USB controllers will be turned off and inaccessible by the OS.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Detected USB Devices	Indicates the number of USB devices.	
USB Controller	When enabled, all onboard USB controllers will be turned on and accessible by the OS. When disabled, all onboard USB controllers will be turned off and inaccessible by the OS.	**Enabled** Disabled
Legacy USB Support	Enables or disables support for legacy USB devices.	**Enabled** Disabled Auto

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Parameter	Description	Option
Port 60/64 Emulation	Enables or disables the I/O port 60/64h emulation support. This parameter is enabled for complete USB keyboard legacy support for non-USB aware OS.	**Enabled** Disabled
Device Reset Timeout	Select the number of seconds POST waits for the USB mass storage device after the start unit command.	10 Seconds **20 Seconds** 30 Seconds 40 Seconds
Storage Emulation RMM	When set to Auto, USB mass storage devices with less than 530 MB will be emulated as a floppy drive. When set to Forced FDD, HDD formatted drive will be emulated as FDD (e.g. Zip drive).	**Auto** Floppy Forced FDD Hard Disk CD-ROM
USB 2.0 Controller	Enables or disables onboard USB ports to support USB 2.0 mode.	**Enabled** Disabled

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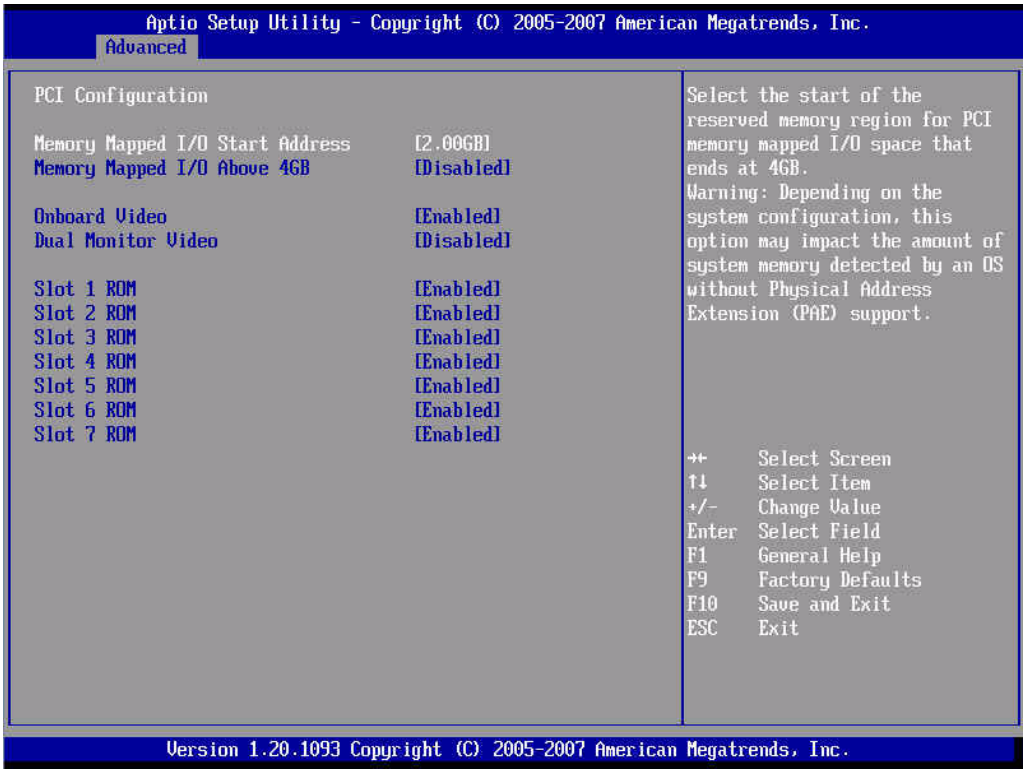
PCI Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
PCI Configuration
Memory Mapped I/O Start Address [2.00GB]
Memory Mapped I/O Above 4GB [Disabled]
Onboard Video [Enabled]
Dual Monitor Video [Disabled]
Slot 1 ROM [Enabled]
Slot 2 ROM [Enabled]
Slot 3 ROM [Enabled]
Slot 4 ROM [Enabled]
Slot 5 ROM [Enabled]
Slot 6 ROM [Enabled]
Slot 7 ROM [Enabled]
Select the start of the reserved memory region for PCI memory mapped I/O space that ends at 4GB.
Warning: Depending on the system configuration, this option may impact the amount of system memory detected by an OS without Physical Address Extension (PAE) support.
↔ Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Memory Mapped I/O Start Address	Select the start of the reserved memory region for PCI memory mapped I/O space that ends at 4 GB. **Note:** Depending on the system configuration, this option may impact the amount of system memory detected by an OS without Physical Address Extension (PAE) support.	**2.00 GB** 2.25 GB 2.50 GB 1.50 GB 1.75 GB
Memory Mapped I/O Above 4 GB	Enables or disables memory mapped I/O of 64-bit PCI devices to 4 GB or greater address space.	Enabled **Disabled**
Onboard Video	Enables or disables the onboard VGA controller.	**Enabled** Disabled

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Parameter	Description	Option
Dual Monitor Video	Select a graphic controller as a primary boot device. **Note:** This parameter will be disabled when the Onboard Video is set to Disabled.	Enabled **Disabled**
Slot <n> ROM	Controls execution of the add-in adapter option ROM during POST. **Note:** If set to disabled, the adapter may not be used to boot the system.	**Enabled** Disabled

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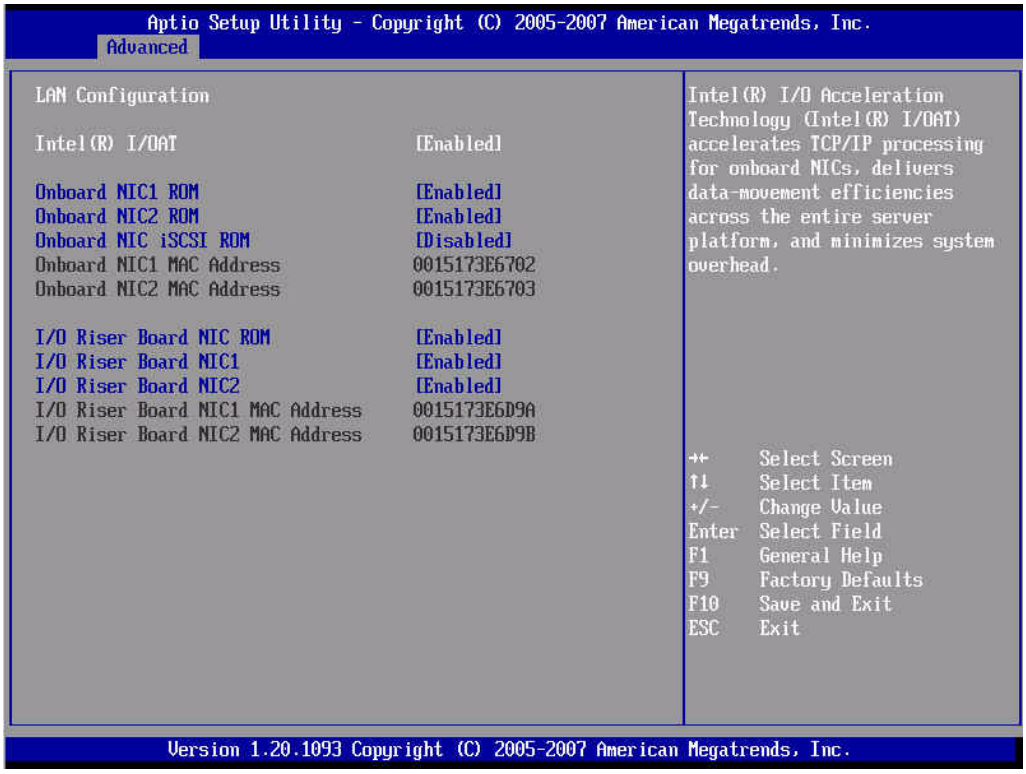
LAN Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
LAN Configuration
Intel(R) I/OAT [Enabled]
Onboard NIC1 ROM [Enabled]
Onboard NIC2 ROM [Enabled]
Onboard NIC iSCSI ROM [Disabled]
Onboard NIC1 MAC Address 0015173E6702
Onboard NIC2 MAC Address 0015173E6703
I/O Riser Board NIC ROM [Enabled]
I/O Riser Board NIC1 [Enabled]
I/O Riser Board NIC2 [Enabled]
I/O Riser Board NIC1 MAC Address 0015173E6D9A
I/O Riser Board NIC2 MAC Address 0015173E6D9B
Intel(R) I/O Acceleration Technology (Intel(R) I/OAT) accelerates TCP/IP processing for onboard NICs, delivers data-movement efficiencies across the entire server platform, and minimizes system overhead.
↔ Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Intel (R) I/OAT	Enables or disables the onboard LAN's I/O Acceleration Technology. The I/O AT accelerates TCP/IP processing for onboard NICs, delivers data movement efficiencies across the entire server platform and minimizes system overhead.	**Enabled** Disabled
Onboard NIC1 or NIC2 ROM	Enables or disables the load of embedded option ROM for onboard network controller. **Note:** If disabled, NIC1 and NIC2 cannot be used to boot the system.	**Enabled** Disabled
Onboard NIC iSCSI ROM	Enables or disables the load of embedded Internet SCSI option ROM for the onboard network controller.	Enabled **Disabled**
Onboard NIC1 or NIC2 MAC Address	Indicates the media access control of the system's LAN controller.	

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Parameter	Description	Option
I/O Riser Board NIC ROM	Load the embedded option ROM for the I/O expansion module network controllers. Note: If disabled, the I/O expansion module (NIC1 and NIC2) cannot be used to boot or wake the system.	**Enabled** Disabled
I/O Riser Board NIC1 or NIC2	Enables or disables the I/O expansion module network controller.	**Enabled** Disabled
I/O Riser Board NIC1 or NIC2 MAC Address	Indicates the media access control of the I/O expansion module's LAN controller.	

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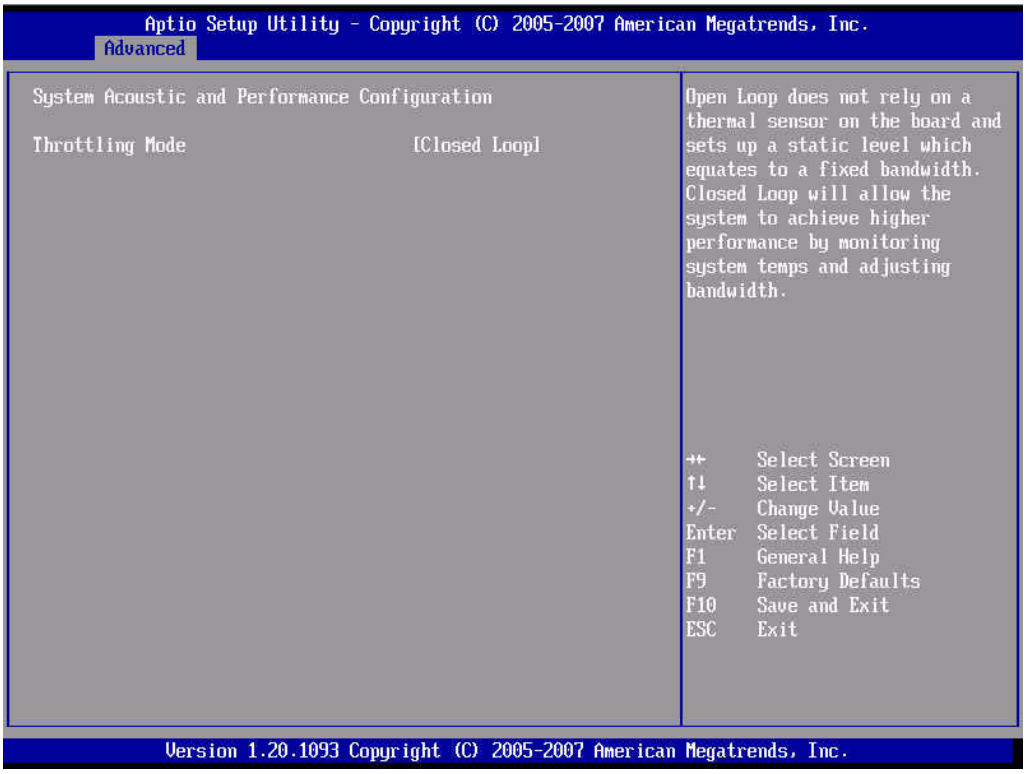
System Acoustic and Performance Configuration


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Advanced
System Acoustic and Performance Configuration
Throttling Mode [Closed Loop]
Open Loop does not rely on a thermal sensor on the board and sets up a static level which equates to a fixed bandwidth. Closed Loop will allow the system to achieve higher performance by monitoring system temps and adjusting bandwidth.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Throttling Mode	Closed loop allows the system to achieve higher performance by monitoring system temps and adjusting bandwith. Open loop does not rely on a thermal sensor on the board and sets up a static level which equates to a fixed bandwidth.	**Closed Loop** Open Loop

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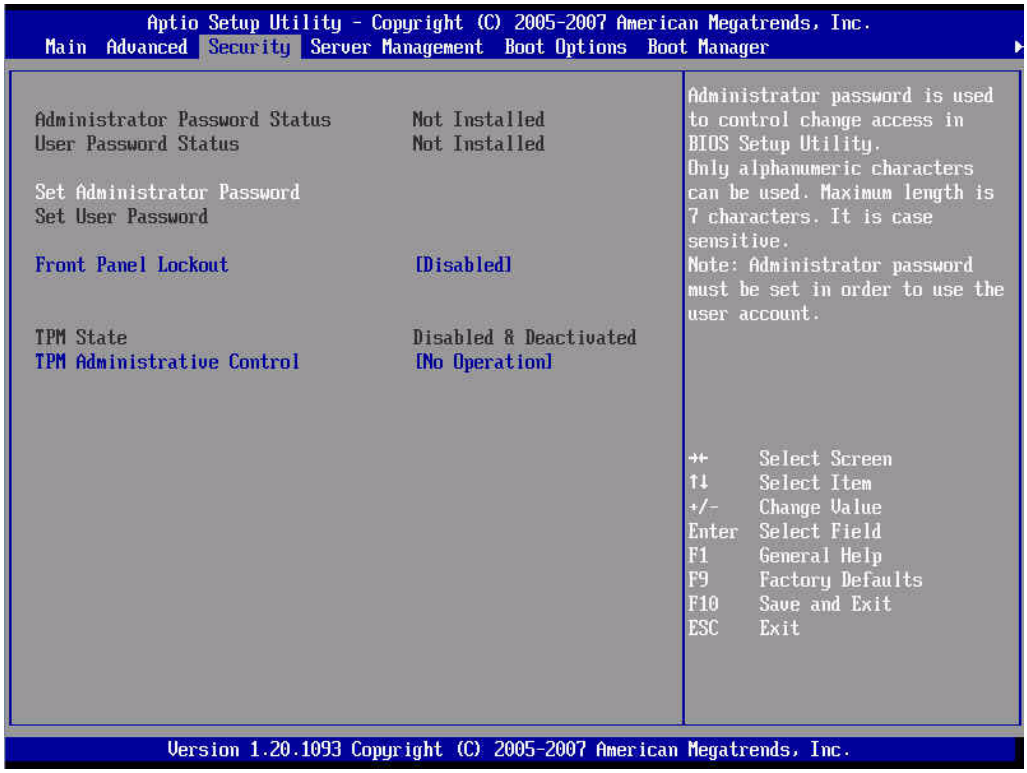
Security menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Main Advanced Security Server Management Boot Options Boot Manager
Administrator Password Status Not Installed
User Password Status Not Installed
Set Administrator Password
Set User Password
Front Panel Lockout [Disabled]
TPM State Disabled & Deactivated
TPM Administrative Control [No Operation]
Administrator password is used to control change access in BIOS Setup Utility.
Only alphanumeric characters can be used. Maximum length is 7 characters. It is case sensitive.
Note: Administrator password must be set in order to use the user account.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Administrator Password Status	Indicates the status of the administrator password.	
User Password Status	Indicates the status of the user password.	
Set Administrator Password	Administrator password prevents unauthorized access to the Setup Utility. Press **Enter** to change the Administrator password.	
Set User Password	User password is used to control entry access to the Setup Utility. User password is available only when an Administrator password is set. Press **Enter** to change the User password.	

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Parameter	Description	Option
Front Panel Lockout	When enabled, the front panel power and reset buttons will be locked. The power and reset operation must be controlled via system management interface.	Enabled **Disabled**
TPM State	Shows the current state of the Trusted Platform Module (TPM) device.	Enabled & Activated Enabled & Deactivated Disabled & Activated **Disabled & Deactivated**
TPM Administrative Control	When set to no operation, there are no changes made to this parameter. When set to turn on, TPM is enabled and activated. When set to turn off, TPM is disabled and deactivated. When set to clear ownership, TPM ownership authentication is removed and returned to factory default state. Note: By default, the BIOS setting will return to the no operation state on every boot cycle.	Turn On Turn Off Clear Ownership **No Operation**

Setting a system password

1 Use the up/down keys to highlight a password parameter (Set Administrator Password or Set User Password) then press **Enter**.

2 Type a password then press **Enter**.

The password may consist of up to seven alphanumeric characters (A-Z, a-z, 0-9).

3 Retype the password to verify the first entry then press **Enter** again.

After setting the password, the system automatically sets the chosen password parameter to **Installed**.

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Changing a system password

1 Use the up/down keys to highlight either change password parameters (Set Administrator Password or Set User Password) then press **Enter**.

2 Type the original password then press **Enter**.

3 Type a new password then press **Enter**.

4 Retype the password to verify the first entry then press **Enter** again.

Removing an administrator password

Note: Removing the administrator password also removes the user password.

1 Use the up/down keys to highlight the Set Administrator Password parameter then press **Enter**.

2 Enter the current password then press **Enter**.

3 Press **Enter** twice without entering anything in the new and confirm password fields.

After doing this, the system automatically sets the User password parameter to **Not Installed**.

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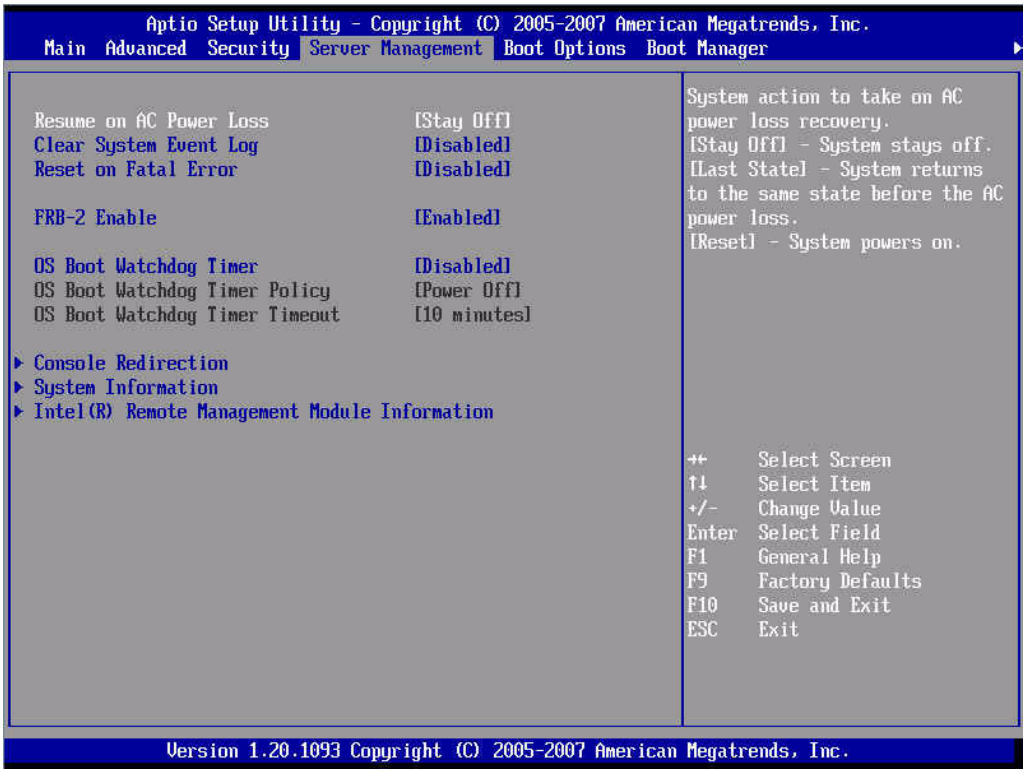
Server Management menu

The Server Management submenu lets you specify the appropriate settings for the system's event handling function.


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Main Advanced Security Server Management Boot Options Boot Manager
Resume on AC Power Loss [Stay Off]
Clear System Event Log [Disabled]
Reset on Fatal Error [Disabled]
FRB-2 Enable [Enabled]
OS Boot Watchdog Timer [Disabled]
OS Boot Watchdog Timer Policy [Power Off]
OS Boot Watchdog Timer Timeout [10 minutes]
Console Redirection
System Information
Intel(R) Remote Management Module Information
System action to take on AC power loss recovery.
[Stay Off] - System stays off.
[Last State] - System returns to the same state before the AC power loss.
[Reset] - System powers on.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
Version 1.20.1093 Copyright (C) 2005-2007 American Megatrends, Inc.

Parameter	Description	Option
Resume on AC Power Loss	Defines the mode of operation if a power loss occurs. When set to Stay Off, the system remains off after power shutdown. When set to Last state, the system returns to the state it was prior to the AC power loss. When set to Reset, the system will turn on after power is restored.	**Stay Off** Last state Reset
Clear System Event Log	Deletes all entries in the System Event Log.	Enabled **Disabled**
Reset on Fatal Error	When enabled, system will trigger a reset in response to fatal errors. When disabled, system will trigger a non-masked interrupt in response to fatal errors.	Enabled **Disabled**

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Parameter	Description	Option
FRB-2 Enable	When enabled, the BMC (Baseboard Management Controller) will reset the system if BIOS does not complete the POST before the FRB-2 (Fault Resilient Boot) timer expires.	**Enabled** Disabled
OS Boot Watchdog Timer	Enables or disables the BIOS timer. It helps to determine if the OS has loaded successfully or followed the OS boot watchdog timer policy. The BIOS timer can only be shut off using the management software after the OS loads.	Enabled **Disabled**
OS Boot Watchdog Timer Policy	When set to Power Off, the system powers off if the watchdog timer expires. When set to Reset, the system performs a reset if the watchdog timer expires. **Note:** The OS Boot Watchdog Timer must be enabled at the same time.	**Power Off** Reset
OS Boot Watchdog Timer Timeout	Timeout value BIOS will use to configure the watchdog timer.	**10 minutes** 15 minutes 20 minutes 5 minutes
Console Redirection	Displays console redirection-related settings. Press **Enter** to access the Console Redirection submenu.	
System Information	Displays basic system ID information, as well as firmware versions. Press **Enter** to access the System Information submenu.	
Intel (R) Remote Management Module Information	Displays information about the I/O expansion module. Press **Enter** to access the System Information submenu. **Note:** This option is displayed if the I/O expansion module is installed.	

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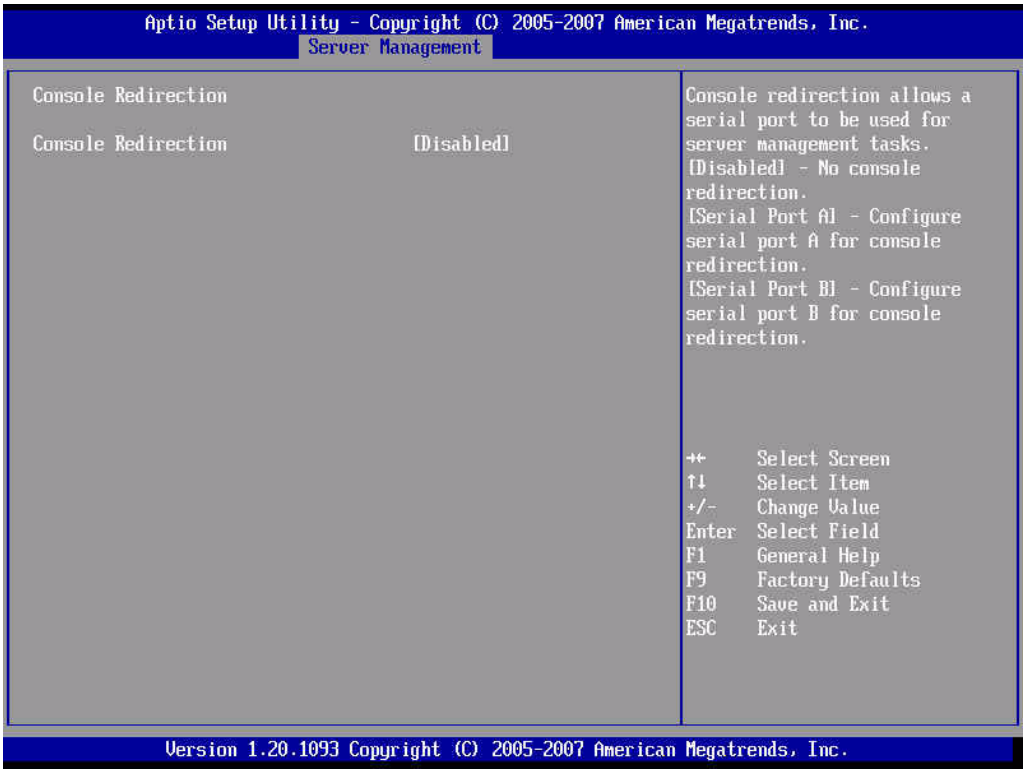
Console Redirection


Aptio Setup Utility - Copyright (C) 2005-2007 American Megatrends, Inc.
Server Management
Console Redirection
Console Redirection [Disabled]
Console redirection allows a serial port to be used for server management tasks.
[Disabled] - No console redirection.
[Serial Port A] - Configure serial port A for console redirection.
[Serial Port B] - Configure serial port B for console redirection.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Console Redirection	Define the serial port used for server management tasks.	**Disabled** Serial Port A Serial Port B
Flow Control*	Set hardware flow control.	**None** RTS/CTS
Baud Rate*	Set the serial port transmission speed.	**115.2 K** 9.6 K 19.2 K 38.4 K 57.6 K
Terminal Type*	Set character formatting used for console redirection.	**VT100** VT100+ VT-UTF8 PC-ANSI

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Parameter	Description	Option
Legacy OS Redirection*	Enables or disables the legacy OS redirection (i.e. DOS) on the serial port. If it is enabled the associated serial port is hidden from the legacy OS.	Enabled **Disabled**

* These fields are not shown on the above screenshot.

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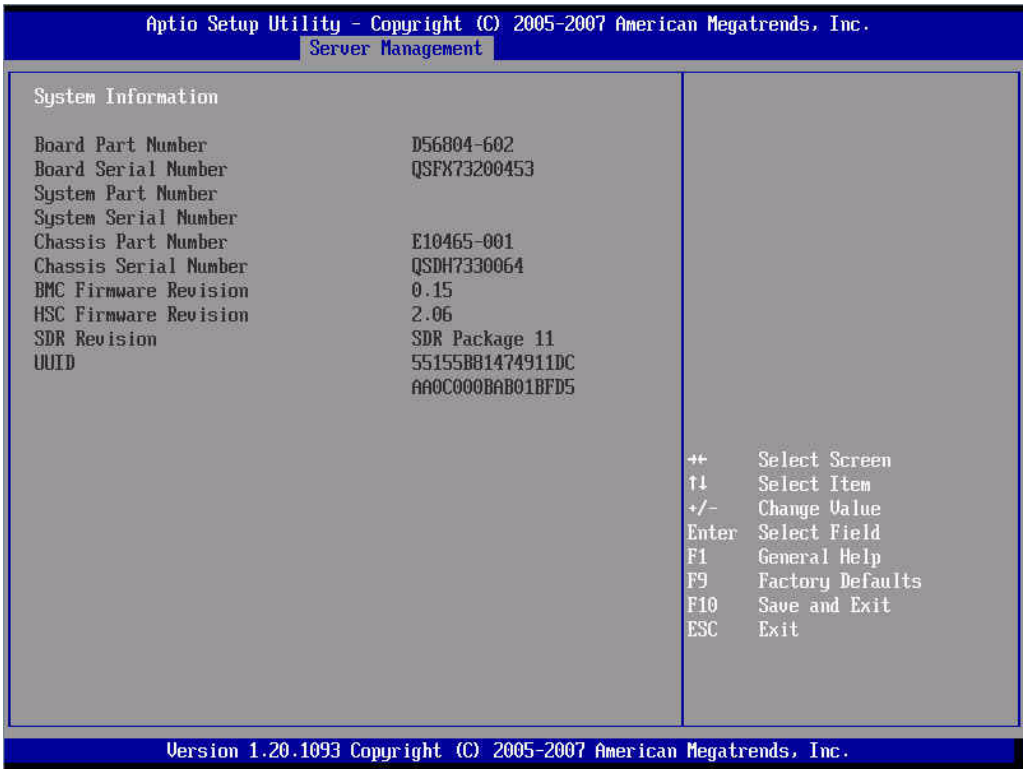
System Information

The System Information submenu displays basic information about the server unit.



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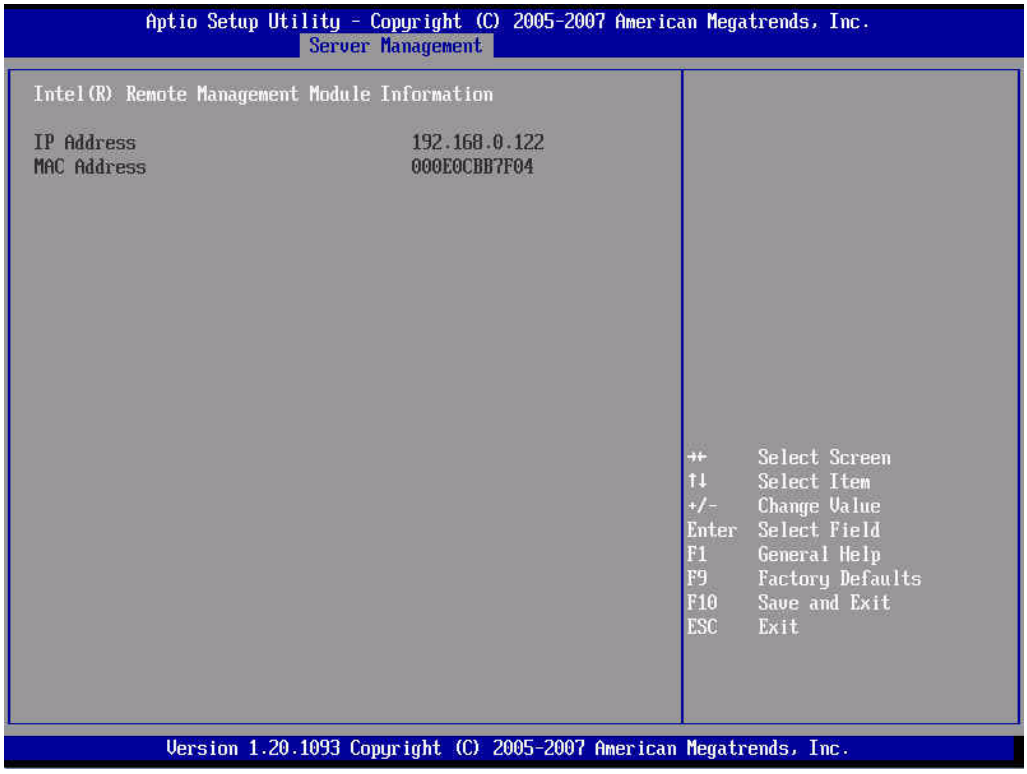
Intel Remote Management Module Information

The Remote Management Module submenu displays information about the firmware revisions and network devices.



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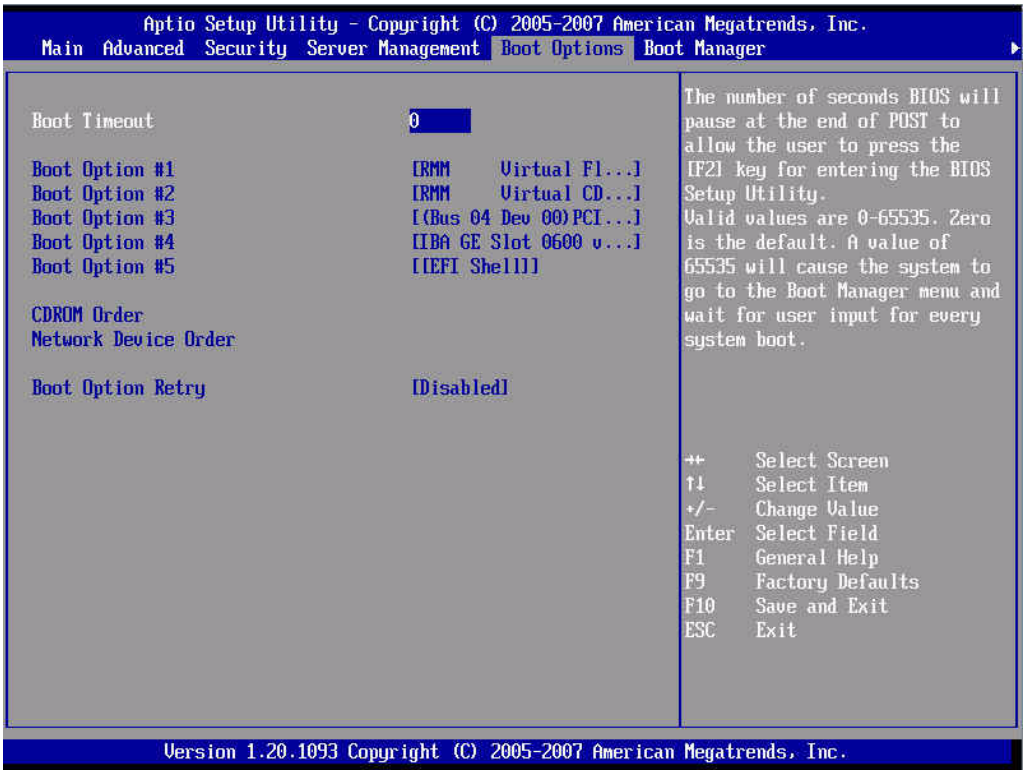
Boot Options menu

The Boot Options menu allows you to set the network device priority during system bootup. It also displays information about the installed storage devices.


Aptio Setup Utility – Copyright (C) 2005-2007 American Megatrends, Inc.
Main Advanced Security Server Management Boot Options Boot Manager
Boot Timeout 0
Boot Option #1 [RMM Virtual Fl...]
Boot Option #2 [RMM Virtual CD...]
Boot Option #3 [(Bus 04 Dev 00)PCI...]
Boot Option #4 [IBA GE Slot 0600 v...]
Boot Option #5 [[EFI Shell]]
CDROM Order
Network Device Order
Boot Option Retry [Disabled]
The number of seconds BIOS will pause at the end of POST to allow the user to press the [F2] key for entering the BIOS Setup Utility.
Valid values are 0-65535. Zero is the default. A value of 65535 will cause the system to go to the Boot Manager menu and wait for user input for every system boot.
++ Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description	Option
Boot Timeout	Sets the automatic boot time-out value. **Note:** A value of 65535 will disable the timeout completely.	**xxxxx**
Boot Option #<n>	Set system boot order by selecting the boot option for this position.	
CDROM Order	Specifies the boot device priority sequence for available CD drives.	
Network Device Order	Specifies the boot device priority sequence for available network devices.	
Boot Option Retry	This will continually retry non-EFI based boot options without waiting for user input.	Enabled **Disabled**

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Boot Manager menu

The Boot Manager menu lets you set the device priority during system bootup. The server will attempt to boot from the first device on the list. If the first device is not available, it will continue down the list until it reaches an available device. Select a boot option, then press **Enter**.

Aptio Setup Utility – Copyright (C) 2005-2007 American Megatrends, Inc.
Main Advanced Security Server Management Boot Options Boot Manager
RMM Virtual Floppy 1.00
RMM Virtual CD/DVD 1.00
(Bus 04 Dev 00)PCI RAID Adapter
IBA GE Slot 0600 v1260
[EFI Shell]
Select this option to boot now. Note: This list is not the system boot option order. Use the Boot Options menu to view and configure the system boot option order.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Error Manager menu

The Error Manager menu lets you view the system POST errors detected by the system.

Parameter	Description	Attribute
Error Code	Displays the POST error beep codes.	
Severity	Major severity requires user intervention but does not stop system boot. Minor severity do not require user intervention or stop the booting of the system. Fatal severity requires user intervention and prohibits the system boot.	Major Minor Fatal
Instance	Displays the instance value. The instance value identifies the component in error.	

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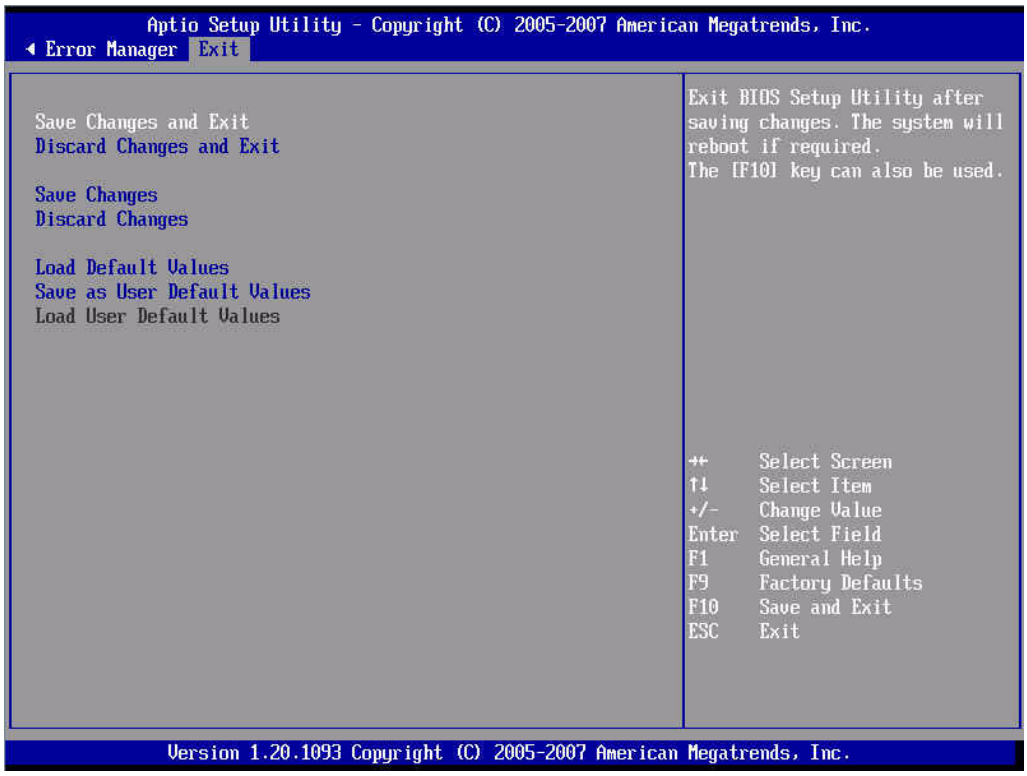
Exit menu

The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.


Aptio Setup Utility – Copyright (C) 2005-2007 American Megatrends, Inc.
Error Manager
Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes
Discard Changes
Load Default Values
Save as User Default Values
Load User Default Values
Exit BIOS Setup Utility after saving changes. The system will reboot if required.
The [F10] key can also be used.
→← Select Screen
↑↓ Select Item
+/- Change Value
Enter Select Field
F1 General Help
F9 Factory Defaults
F10 Save and Exit
ESC Exit
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Parameter	Description
Save Changes and Exit	Saves changes made and close the BIOS setup.
Discard Changes and Exit	Discards changes made and close the BIOS setup.
Save Changes	Saves changes made in the BIOS setup.
Discard Changes	Discards all changes made in the BIOS setup.
Load Default Values	Loads the default settings for all BIOS setup parameters. Setup defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly.

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Parameter	Description
Save as User Default Values	Saves current values to be restored later.
Load User Default Values	Restores previously saved user default values.

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Upgrading the BIOS

The upgrade utility allows you to upgrade the BIOS in the flash memory. To prepare to upgrade the BIOS, you need to record the current BIOS settings and download the BIOS image file to a temporary folder on your hard drive or a USB flash memory device.

To record the current BIOS settings:

1 Run BIOS setup. See "Entering BIOS setup" on page 100.

2 Write down the current settings in the Setup Utility.

To download the BIOS image file:

Download the image file to a temporary folder on your hard drive or a USB flash memory device.

Note: Review the instructions and release notes that are provided in the Readme file distributed with the BIOS image file before attempting a BIOS upgrade. The release notes contain critical information regarding jumper settings, specific fixes, or other information to complete the upgrade.

To upgrade the BIOS:

Follow the instructions in the Readme file that came with the BIOS upgrade. When the update completes, remove the bootable media from which you performed the upgrade.

Note: Do not power down the system during the BIOS update process. The system will reset automatically when the BIOS update process is completed. You may encounter a CMOS checksum error or other problem after reboot. It this happens, shut down the system and boot it again. CMOS checksum errors require that you enter Setup, check your settings, save your settings, and exit Setup.

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5 System troubleshooting

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This chapter provides possible solutions for specific problems. If you cannot correct the problem, contact your local Acer representative or authorized dealer for assistance.

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Troubleshooting

This chapter helps you identify and solve problems that might occur while you are using the system.

For any issue, first ensure that you are using the latest firmware and files. In addition to the server firmware and files, make sure to update any drivers used for components you have installed in your system, such as video drivers, network drivers and SAS drivers.

If you are unable to resolve your server problems on your own, contact your dealer or local Acer representative for assistance.

Resetting the system

Before going through in-depth troubleshooting, attempt first to perform reset the system using one of the methods below.

To do this	Press
Soft boot reset to clear the system memory and reload the operating system.	Ctrl+Alt+Del
Clear system memory, restart POST, and reload the OS.	Reset button
Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system and halts power to all peripherals.	Power off/on

Problems following initial system installation

Problems that occur at initial system startup are usually caused by an incorrect installation or configuration. Hardware failure is a less frequent cause. If the problem you are experiencing is with a specific software application, see "There is problem with the application software" on page 144.

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First steps checklist

- AC power available at the wall outlet?
- Are the power supplies plugged in? Check the power cable(s) on the back of the chassis and at the AC source.
- Are all cables correctly connected and secured?
- Is the processor fully seated in the socket on the mainboard?
- Are all standoffs in the proper location and not touching any components, causing a potential short?
- Are all expansion boards fully seated in their slots on the mainboard?
- Are all jumper settings on the mainboard correct?
- Are all jumper and switch settings on expansion boards and peripheral devices correct? If applicable, ensure that there are no conflicts - for example, two expansion boards sharing the same interrupt.
- Are all peripheral devices installed correctly?
- If the system has a hard disk drive, is it properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made in BIOS setup correct?
- Is the operating system properly loaded? Refer to the operating system documentation.
- Did you press the system power button on the front panel to turn the server on (power indicator should be lit)?
- Is the system power cord properly connected to the system and plugged into an outlet for 110-240 V?
- Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list.

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Hardware diagnostic testing

This section provides a more detailed approach to identifying a hardware problem and locating its source.

Caution! Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1. Turn off the system and all external peripheral devices. Disconnect each of device from the system, except for the keyboard and the video monitor.
2. Make sure the system power cord is plugged into a properly grounded AC outlet.
3. Make sure your video display monitor and keyboard are correctly connected to the system. Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).
4. If the operating system normally loads from the hard disk drive, make sure there is no disc in the optical drive.
5. If the power indicator does light, attempt to boot from a disc.
6. Turn on the system. If the power indicator does not light, see “Power indicator does not light” on page 140.

Verifying proper operation of key system lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check if the HDD activity indicator lights briefly? If not, see “HDD activity indicator does not light.” on page 141.

Confirming loading of the OS

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see "No Characters Appear on Screen" on page 145.

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Specific problems and corrective actions

The following contains specific problems that may arise during the use of your server. Possible solutions are listed for each problem.

Power indicator does not light.

Do the following:

- Make sure the power button on the front panel is turned on.
- Make sure the power cable is connected correctly.
- Make sure that the wall outlet has power. Test it by plugging another device.
- Remove all non-hot-plug expansion cards and see if the system boots. If successful, add the cards back in one at a time with a reboot between each addition.
- Make sure the memory board and memory modules comply with the system requirements.
- Make sure the memory modules have been populated according to the system requirements.
- Remove and reseat the memory board.
- Remove and reseat the memory modules.
- Make sure the processor complies with the system requirements.
- Make sure the processor is populated according to the system requirements.
- Remove and reseat the processor.
- Make sure the chassis standoffs are installed only below mounting holes. Misplaced standoffs may have contact to the pins on the bottom of the mainboard and cause a short.

Server powers on but turns off often with fault light.

Do the following:

- Make sure the memory boards are properly seated.
- Make sure the processor is properly seated.

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Server boot does not complete POST.

Do the following:

- Make sure the processor is properly seated.
- Check the BIOS release notes to ensure the BIOS installed on the platform supports the stepping and the family of processors currently installed.
- Make sure the memory boards are populated according to system requirements.

Server does not recognize all of the processors installed.

- Make sure the processor is properly seated.

HDD activity indicator does not light.

Do the following:

- Make sure the drive is not disabled in the system BIOS.
- Make sure the drive's power and data cables are connected correctly.
- Make sure the drive is compatible.
- Make sure you have not exceeded the power budget for the server.
- If using a RAID configuration with SAS drives, make sure the server RAID adapter is installed correctly.

If you have installed one or more hard drives in the system, do the following:

- Make sure the power and signal cables are connected correctly.

ODD (Optical disk drive) activity indicator does not light.

Do the following:

- Make sure the power and signal cables are properly installed.
- Check that relevant switches and jumpers on the drive are set correctly.

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- Check that drive is properly configured.
- Check that onboard IDE controller is enabled in the BIOS Setup Utility.

ODD tray cannot be ejected.

- Insert the tip of a paperclip into the small hole on the ODD drive. Slowly pull the tray out from the drive until the tray is fully extended then remove the disc.

ODD drive cannot read a disc.

Do the following:

- Make sure you are using the correct type of disc.
- Make sure the disc is properly seated in the drive.
- Make sure the disc is unscratched.
- Make sure all cables are connected to the ODD.

Hard drives are not recognized.

- Make sure the drive is not disabled in the system BIOS.
- Make sure the drive is connected correctly and the power cable is plugged to the power supply.
- Make sure the drive is compatible.
- Make sure that you have not exceeded the power budget for the server.

Bootable CD drive is not detected.

- Make sure the Boot settings in the system BIOS is configured to allow the CD drive to be the first bootable device.

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New memory modules installed are not detected.

Do the following:

- Make sure the memory modules are properly seated on the memory board's DIMM slots.
- Make sure the memory modules comply with the system requirements.
- Make sure the memory modules have been populated according to the system requirements.

External device connected to a USB connector does not work.

Do the following:

- Reduce the number of external devices connected to a USB hub.
- Refer to the documentation that came with the device.

Cannot connect to a server.

- Make sure the network cable is securely attached to the correct connector at the system rear panel.
- Try a different network cable.
- Make sure you are using the correct and the current drivers.
- Make sure the driver is loaded and the protocols are bound.

Problems with the network

Network status indicator does not light.

Do the following:

- Check the cabling and network equipment to make sure that all cables are properly connected.
- Reinstall the network drivers.
- Try another port or hub on the switch.

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Diagnostics pass but the connection fails.

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in the NET.CFG file.

The controller stopped working when an adapter was installed.

- Make sure the cable is connected to the port from the onboard network controller.
- Make sure the other adapter supports shared interrupts and your OS supports shared interrupts.
- Try reseating the adapter.

The adapter stopped working without apparent cause.

- Try reseating the adapter first, then try a different slot if necessary.
- The network files driver may be corrupt or deleted. Delete and reinstall the drivers.
- Run the diagnostics.

Network activity indicator does not light.

Do the following:

- Make sure the correct network drivers are loaded on the system.
- Network might be idle. Try accessing the server.

Server hangs when the drivers are loaded.

- Change the PCI interrupt settings.

There is problem with the application software.

Do the following:

- Verify that the software is properly configured for the system. Refer to the software installation and operation documentation for instructions on setting up and using the software.

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- Try a different version of the software to see if the problem is with the copy you are using.
- Make sure all cables are properly connected.
- If other software runs correctly on the system, contact your vendor about the defective software.

No characters appear on the screen.

Check the following:

- Is the keyboard functioning? Test it by turning the "Num Lock" function on and off to make sure the Num Lock light is functioning.
- Is the video monitor plugged in and turned on? If you are using a switch box, is it switched to the correct system?
- Are the brightness and contrast controls on the video monitor properly adjusted?
- Is the video monitor signal cable properly installed?
- Does this video monitor work correctly if plugged into a different system?
- Is the onboard video controller enabled in the BIOS Setup Utility?
- Remove all expansion cards and see if the system boots. If successful, add the cards back in one at a time with a reboot between each addition.
- Make sure the memory modules comply with the system requirements.
- Make sure the memory modules have been populated according to the system requirements.
- Remove and reseat the memory boards.
- Remove and reseat the memory modules.
- Make sure the processor complies with the system requirements.
- Make sure the processor is populated according to the system requirements.

If you are using a video controller board, do the following:

1 Verify that the video works using the onboard video controller.

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2 Verify that the video controller board is fully seated in the mainboard connector.

3 Reboot the system for changes to take effect.

4 If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.

5 If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. Contact your service representative or authorized dealer for help.

Characters are distorted or incorrect.

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? Refer to the documentation that came with the video monitor.
- Are the video monitor's signal and power cables properly connected.
- Is the video monitor working correctly when plugged into a different system?

System cooling fan do not rotate properly.

If the system cooling fan is not operating properly, it is an indication of possible system component failure.

Check the following:

- Is the power indicator lit? If not, see "Power indicator does not light." on page 140 .
- Is the hot-swap fan module LED lit?
- Are any other control panel LEDs lit?
- Have any of the fan motors stopped? Use the server management subsystem to check the fan status.
- Have your fans speeded up in response to an overheating situation?
- Have your fans speeded up in response to a fan that has failed?

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- Is the fan's power connector properly connected to the mainboard?
- Is the front panel board cable connected to both the mainboard's front panel board connector?
- Are the power supply cables properly connected to the mainboard?
- Are there any shorted wires caused by pinched cables or have power connector plugs been forced into power connector sockets the wrong way?

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Appendix A: Rack mount configuration

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This appendix shows you how to set up the Altos R920 system in a rack mount configuration.

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Rack installation information

Important! Observe the electrostatic discharge (ESD) precautions indicated on page 39 when perfoming the following procedures. Do not attempt the procedures described in the following sections unless you are a qualified technician.

Rack installation precautions

Follow the rack manufacturer's safety and installation instructions for proper rack installation.

The following additional rack safety installation measures should be considered:

- Anchor the equipment rack

  The equipment rack must be anchored to an unmovable suitable support to prevent the rack from falling over when one or more systems are fully extended out of the rack assembly. You must also consider the weight of any other devices installed in the rack assembly. The equipment rack must be installed according to the manufacturer's instructions.

- Main AC power disconnect

  You are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the system(s).

- Earth ground the rack installation

  To avoid the potential for an electrical shock hazard, the rack assembly itself must be suitably earth grounded, according to your local regional electrical codes. This typically will require the rack to have its own separate earth ground. We recommend you consult your local approved electrician.

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- Elevated operating ambient temperature

  The maximum operating temperature of the system is 35 °C (95°F). Careful consideration should be given to installing the system in an environment compatible with the 35 °C (95°F) maximum ambient temperature.

- Reduced airflow

  The amount of airflow required for the safe operation of the equipment should not be compromised when installing the system in a rack.

- Mechanical loading

  Exercise care when mounting the system in a rack to avoid any accidents.

- Circuit overloading

  Appropriate consideration should be given when connecting the supply circuit to the system to avoid any circuit overload. The system name plate rating should be used when addressing concerns about circuit overload.

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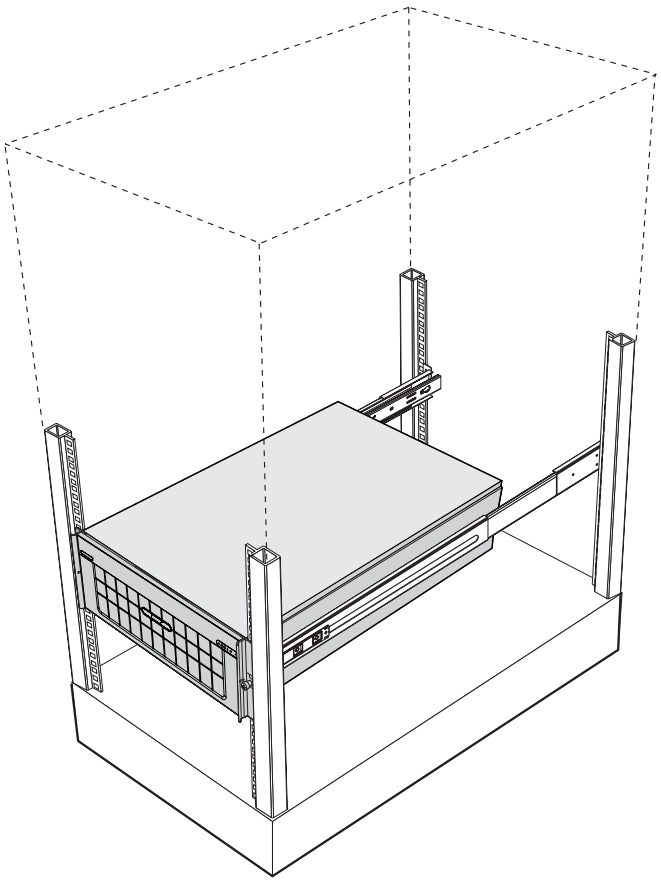
Rack mount configuration

The Altos R920 server system should be mounted into a rack cabinet. A rack rail and CMA (cable management arm) kit is available for installing system to a rack cabinet.

The figure below shows the Altos R920 system in a rack-mount position.



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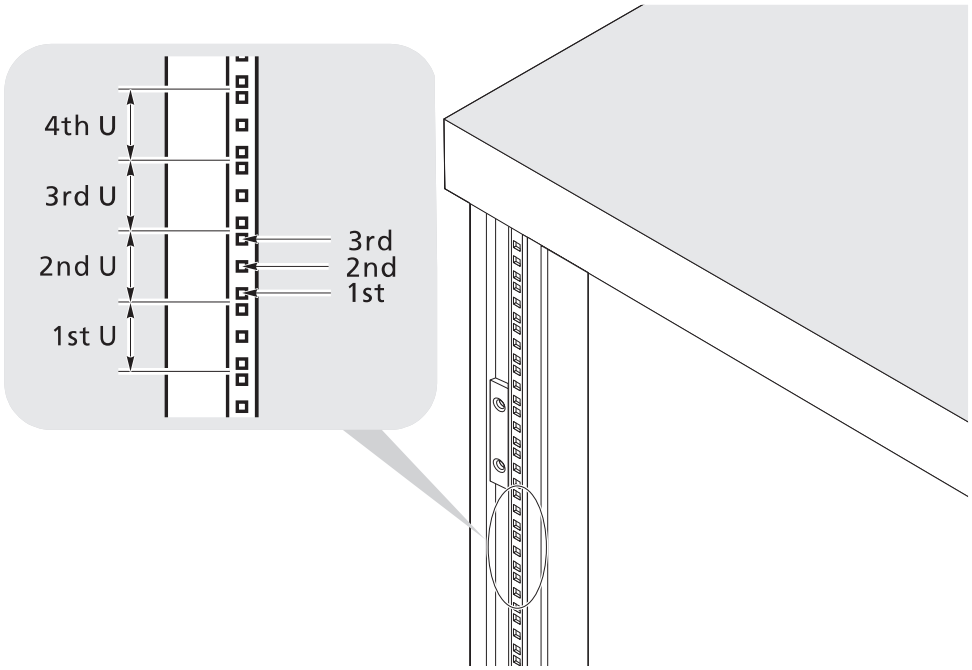
Vertical mounting hole pattern

The four vertical rails of the system rack contain mounting holes arranged in a manner shown in the figure below:



The system occupies 4U in the rack. Count the U positions and hole numbers from the bottom up.

The distance from the center of two holes with closer spacing to the center of the next pair is equivalent to 1U.

Note: The unit of measurement used in this guide is "U" (1U = 1.75 inches or 44.45 mm). The total sum of the heights of all components in the rack measured in "U" cannot exceed the height of the rack. For more information, refer to the documentation that came with the system rack.

When installing components, you must start your measurement from the center of the two holes with closer spacing. Otherwise, the screw holes on the component may not match those on the rack.

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Installing the system into the rack

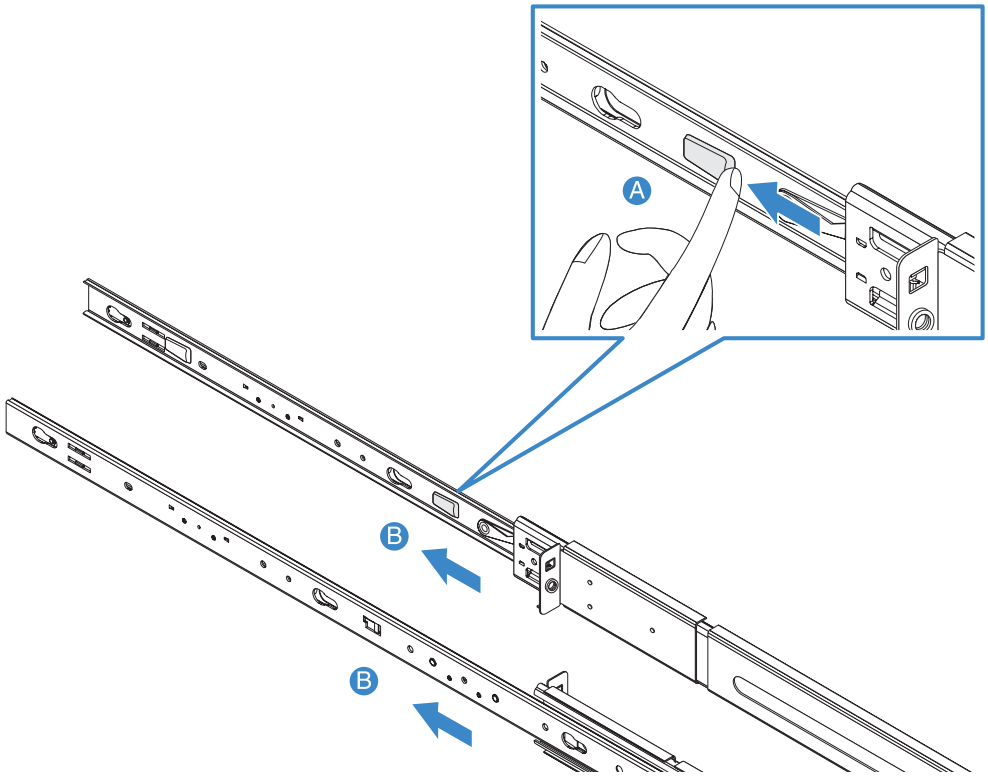
Caution! To minimize the chances of injuries, make sure that two or more people help in installing the server.

To install the system into a four-post rack:

1 Remove the inner rails from the mounting rails.

(1) Extend the inner rail from the mounting rail until the rail release latch clicks.

(2) Depress the release latch **(A)** and slip the inner rail out **(B)**.



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(3) Do the same thing to the other mounting rail.

Caution! To avoid personal injury, care should be taken when pressing the inner rail release latches and sliding the component into the rack.

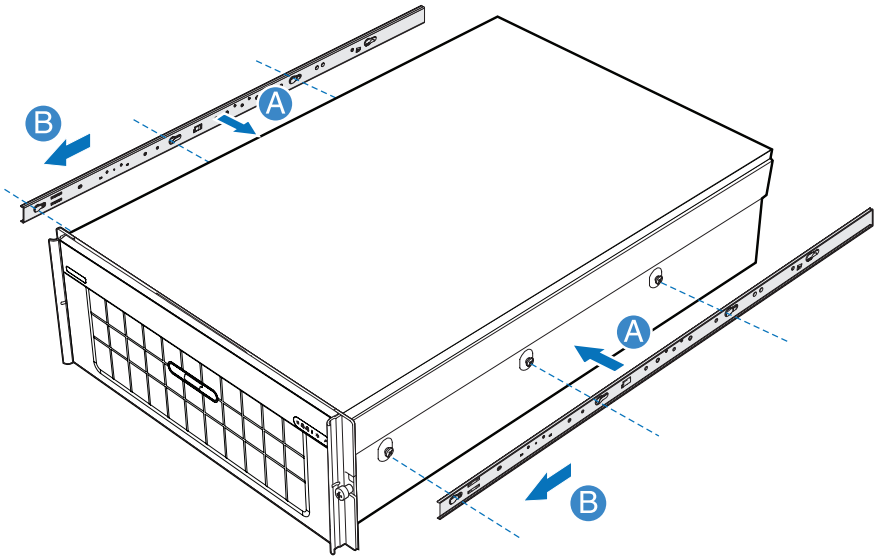
2 Attach the inner rails to both sides of the server.

Please use screws that came with the rack-mount kit when attaching the inner rails to both sides of the server. If your system already has screws attached, please remove them.

Note: Using screws other than those supplied in this rack-mount kit to attach the rails will void the warranty, Acer cannot be held responsible for any damage for incorrect installation.

(1) Align the screw holes of the inner rail to the server screws **(A)**.

(2) Slide the rails to the left until the rails lock into place with an audible click **(B)**.



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3 Install the mounting rails to the rack posts.

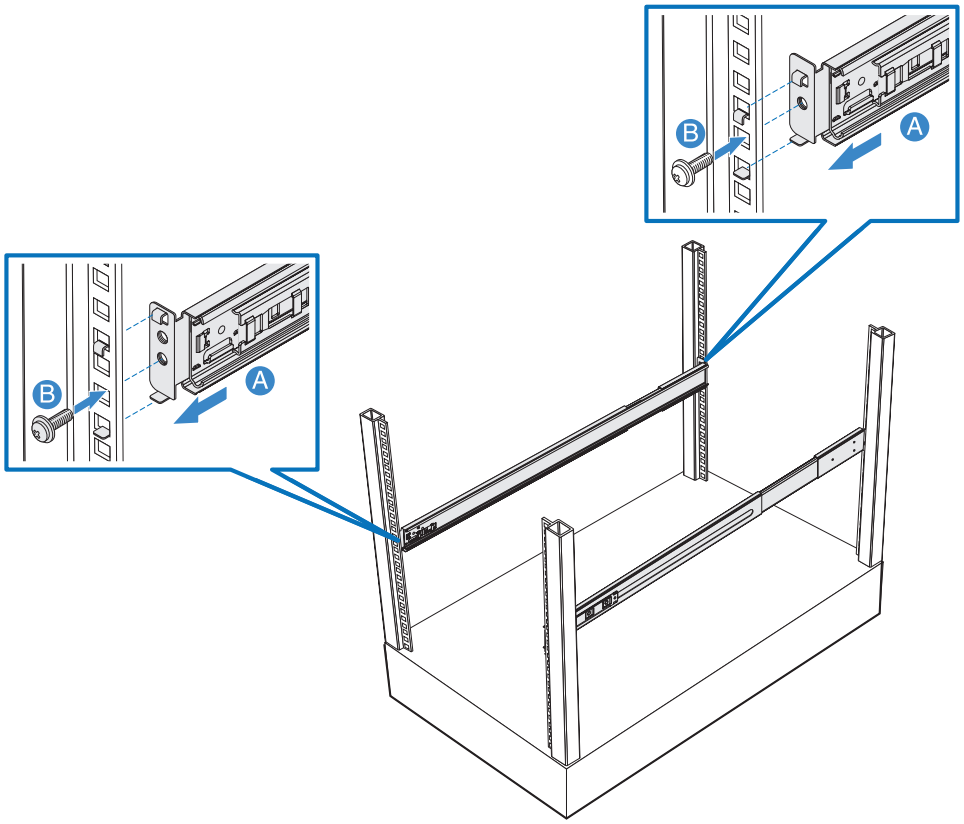
(1) Determine the vertical position in the rack. Refer to “Vertical mounting hole pattern” on page 154 for more information.

(2) Align and insert the mounting rail into the rack posts’ mounting holes **(A)**.

(3) Make certain the proper mounting holes on the rack post are selected.

(4) Use two metal screws to secure the front and rear mounting rail to the rack **(B)**.

(5) Do the same thing to the other mounting rail.



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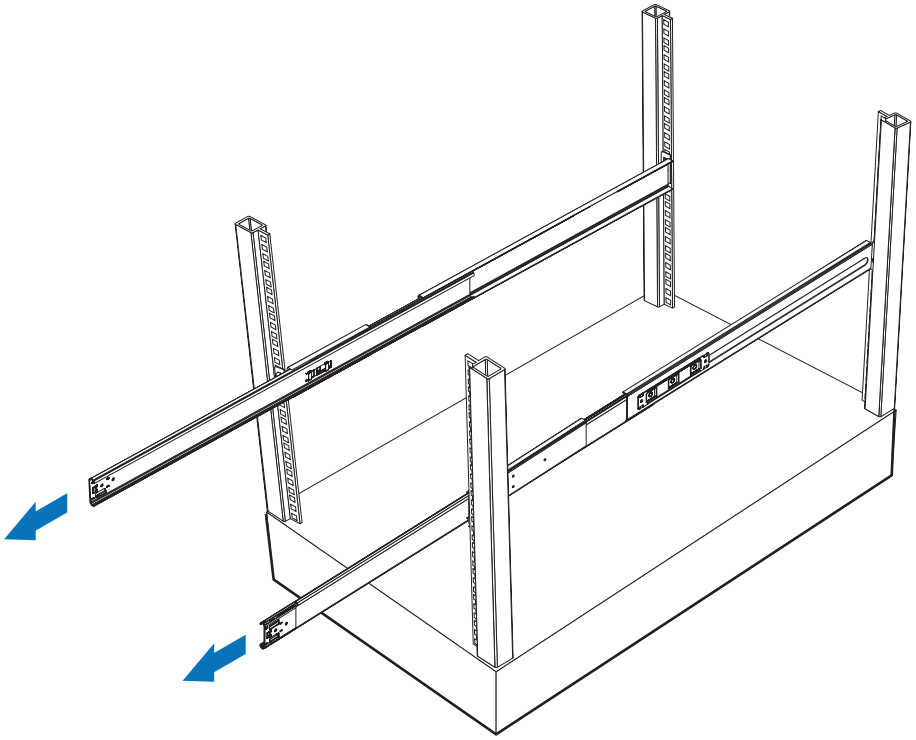
(6) Fully extend the mounting rails on the rack.



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4 Install the server into the rack.

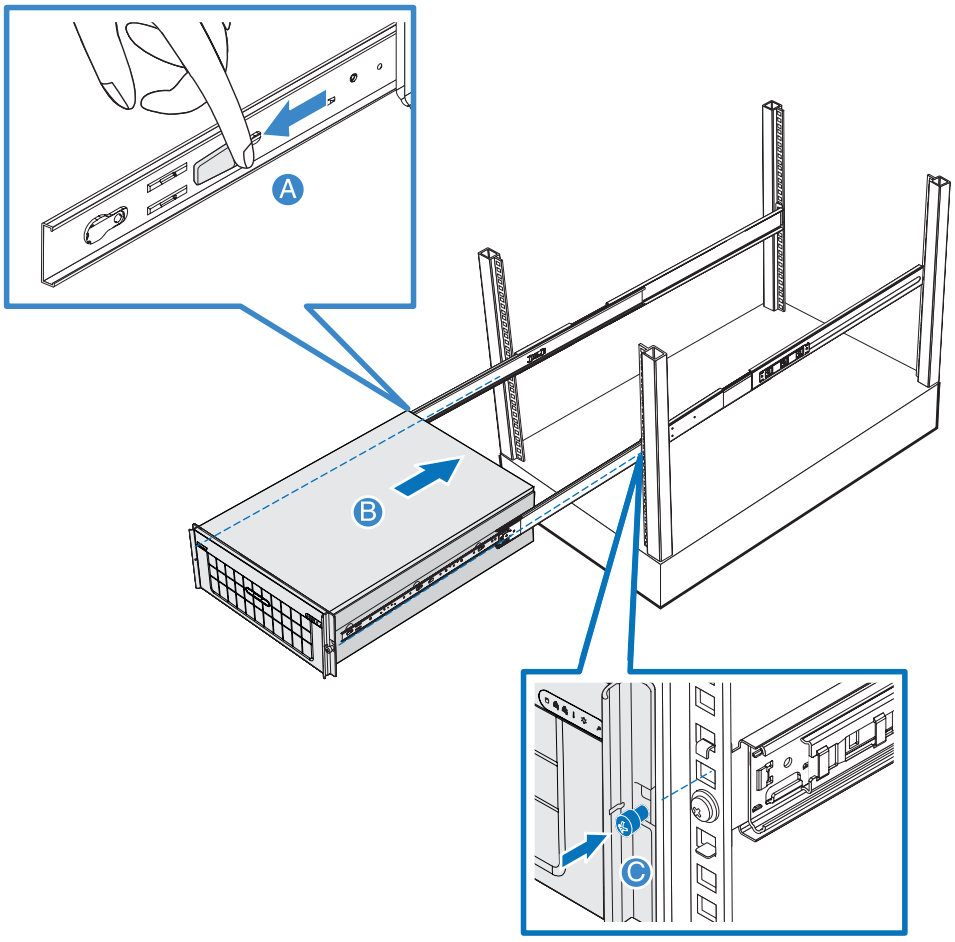
Caution! To avoid personal injury, care should be taken when pressing the inner rail release latches and sliding the component into the rack.

(1) Carefully align the inner rails attached to the server with the fully extended mounting rails on the rack.

(2) Press the release latch on both sides of the server **(A)**.

(3) Insert the inner rails into the mounting rails, then push the server into the rack until you hear a click sound **(B)**.

(4) Secure the server to the rack using the two front panel thumbscrews **(C)**.



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5 Attach the CMA (cable management arm) to the rear of the server.

The CMA allows you to tie-wrap all cables to and from the system. As you slide the system in and out of the rack, the CMA collapses and extends, keeping the cables untangled and attached to the system.

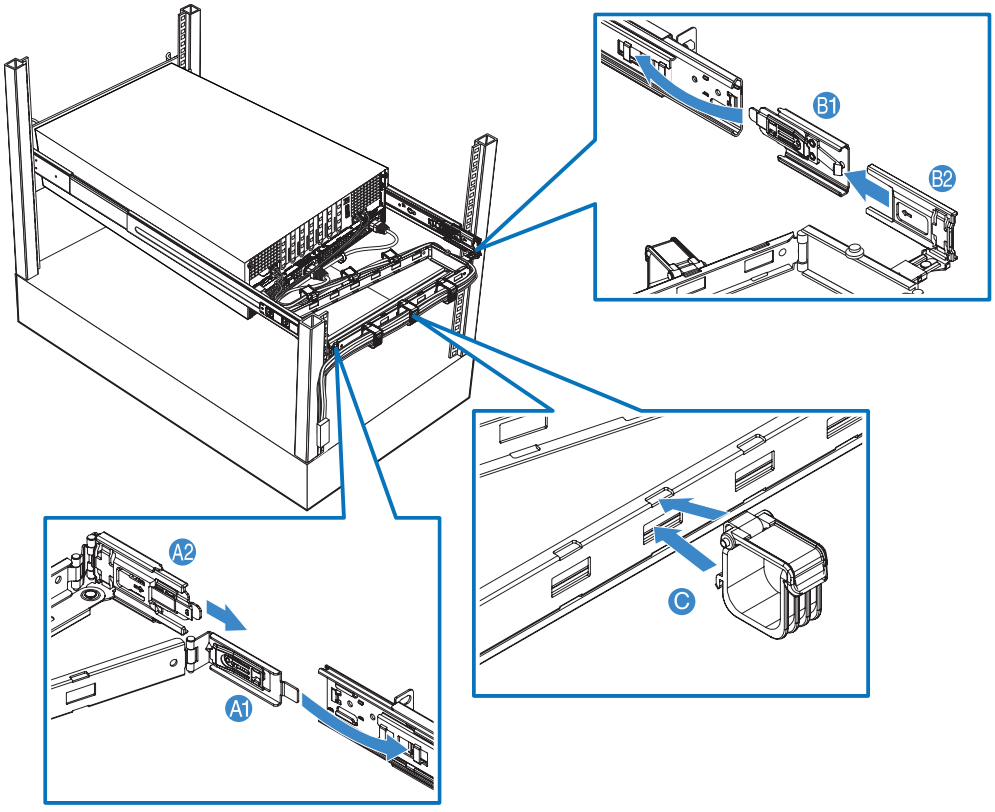
(1) Insert the smaller CMA extension into the rear of the left inner rail **(A1)**.

(2) Insert the larger CMA extension into the rear of left mounting rail **(A2)**.

(3) Insert the CMA extension connector into the rear of the right mounting rail **(B1)**.

(4) Insert the CMA arm connector into the blue plastic cutout on the CMA extension connector **(B2)**.

(5) Attach the cable clips into the appropriate mounting holes in the CMA **(C)**.



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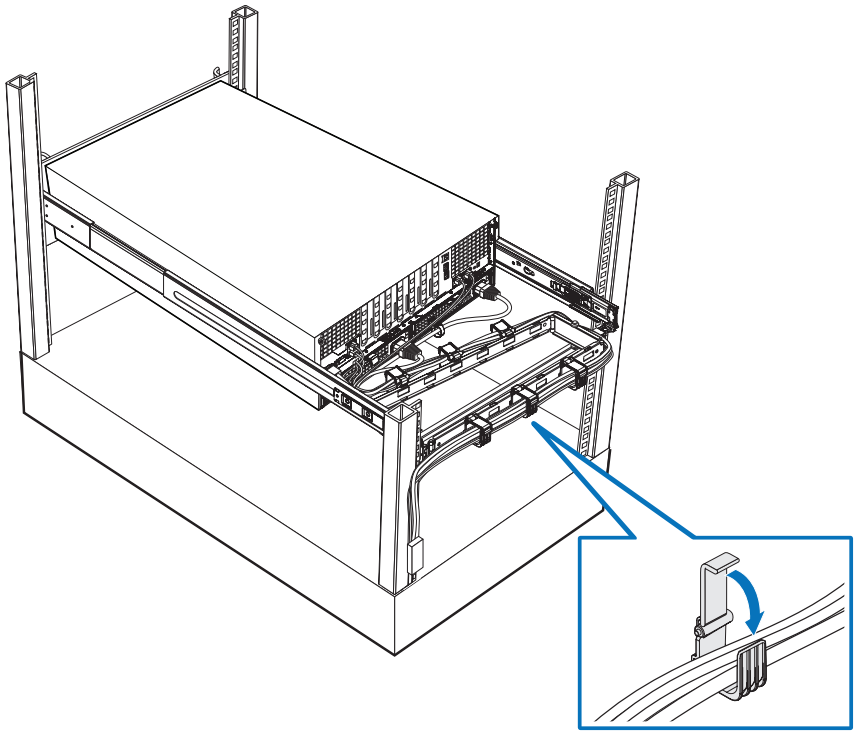
(6) Connect the power, peripheral and networking cables into their appropriate ports.
Refer to “Connecting peripherals” on page 32 for detailed instructions.

(7) Route all cables through the cable clips.



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Appendix B: Memory configuration

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This chapter provides details on how to configure the system memory boards. Recommended memory board and FBDIMM installation order and FBDIMM population order tables are also included.

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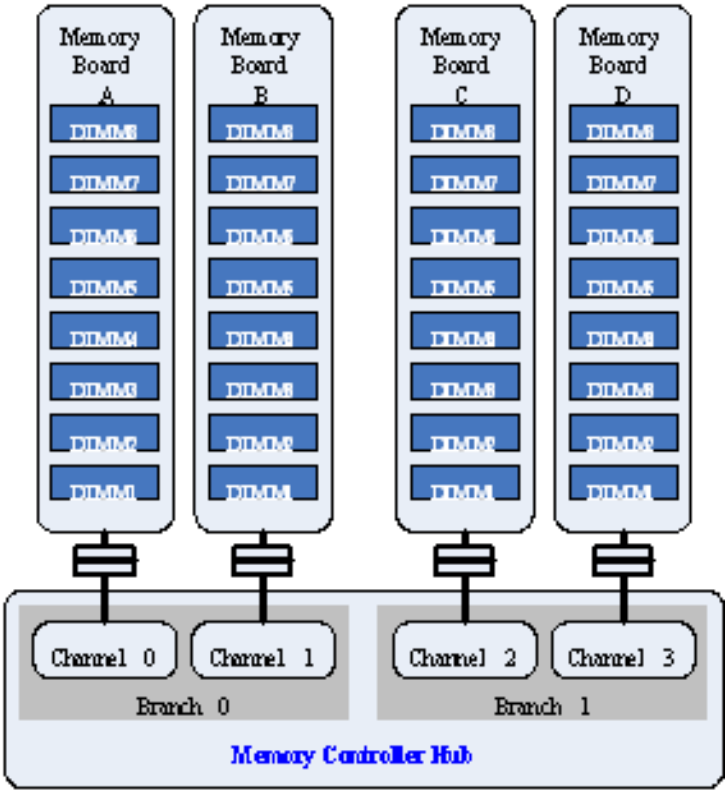
Introduction

The system's memory architecture supports up to four memory boards organized by branches and channels. The MCH (memory controller hub) on the north bridge has two branches with branch 0 going to channels 0 and 1 or memory board A and B, and branch 1 to channels 2 and 3 or memory board C and D.



In dual-channel mode, FBDIMMs on adjacent channels work in lockstep to provide the same cache line data and a combined ECC. In the single-channel mode only channel 0 is active. The BIOS dynamically configures the memory controller in accordance with the available FBDIMM population and the selected RAS (reliability, availability, serviceability (RAS) mode operation.

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The memory boards connect to the mainboard through the memory board slots A, B, C, and D (Each slot support the x16 PCI Express mechanical slot, refer to “Mainboard” on page 12 for the location of the memory board slots.). Each memory board is equipped with eight DIMM slots that supports 1 GB, 2 GB, or 4 GB DDR2-667 MHz (PC-5300) FBDIMM modules. The memory board includes a DIMM fault LED that is used to report DIMM failures and error conditions.

Refer to “Memory configuration” on page 171 for details on the available system memory configuration.

Memory board installation order

The table below lists the suggested memory board installation order.

<table>
<tr><th rowspan="2">Memory board slot</th><th colspan="3">Installation order</th></tr>
<tr><th>Normal configuration</th><th>Memory sparing configuration</th><th>Memory mirroring configuration</th></tr>
<tr><td>A</td><td>1</td><td rowspan="2">Set 1</td><td rowspan="4">Note: Requires installation of four memory boards with equal memory capacity.</td></tr>
<tr><td>B</td><td>2</td></tr>
<tr><td>C</td><td>3</td><td rowspan="2">Set 2
Note: Requires installation of two or four sets of memory boards, paired as sets of two. Each memory board in a set must have same amount of memory board installed.</td></tr>
<tr><td>D</td><td>4</td></tr>
</table>

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FBDIMM module population order

Single and dual channel population

The tables below list the suggested FBDIMM module population for normal configuration.

Population with one memory board

DIMM slot	Memory board A	Memory board B	Memory board C	Memory board D	Total memory
1 to 2	2 x 1 GB				2 GB
1 to 4	4 x 1 GB				4 GB
1 to 6	6 x 1 GB				6 GB
1 to 8	8 x 1 GB				8 GB
1 to 2	2 x 2 GB				4 GB
1 to 4	4 x 2 GB				8 GB
1 to 6	6 x 2 GB				12 GB
1 to 8	8 x 2 GB				16 GB
1 to 2	2 x 4 GB				8 GB
1 to 4	4 x 4 GB				16 GB
1 to 6	6 x 4 GB				24 GB
1 to 8	8 x 4 GB				32 GB

Population with two memory boards

DIMM slot	Memory board A	Memory board B	Memory board C	Memory board D	Total memory
1 to 2	2 x 1 GB	2 x 1 GB			4 GB
1 to 4	4 x 1 GB	4 x 1 GB			8 GB
1 to 6	6 x 1 GB	6 x 1 GB			12 GB
1 to 8	8 x 1 GB	8 x 1 GB			16 GB
1 to 2	2 x 2 GB	2 x 2 GB			8 GB
1 to 4	4 x 2 GB	4 x 2 GB			16 GB
1 to 6	6 x 2 GB	6 x 2 GB			24 GB
1 to 8	8 x 2 GB	8 x 2 GB			32 GB
1 to 2	2 x 4 GB	2 x 4 GB			16 GB
1 to 4	4 x 4 GB	4 x 4 GB			32 GB
1 to 6	6 x 4 GB	6 x 4 GB			48 GB
1 to 8	8 x 4 GB	8 x 4 GB			64 GB

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Population with four memory boards

DIMM slot	Memory board A	Memory board B	Memory board C	Memory board D	Total memory
1 to 2	2 x 1 GB	2 x 1 GB	2 x 1 GB	2 x 1 GB	8 GB
1 to 4	4 x 1 GB	4 x 1 GB	4 x 1 GB	4 x 1 GB	16 GB
1 to 6	6 x 1 GB	6 x 1 GB	6 x 1 GB	6 x 1 GB	24 GB
1 to 8	8 x 1 GB	8 x 1 GB	8 x 1 GB	8 x 1 GB	32 GB
1 to 2	2 x 2 GB	2 x 2 GB	2 x 2 GB	2 x 2 GB	16 GB
1 to 4	4 x 2 GB	4 x 2 GB	4 x 2 GB	4 x 2 GB	32 GB
1 to 6	6 x 2 GB	6 x 2 GB	6 x 2 GB	6 x 2 GB	48 GB
1 to 8	8 x 2 GB	8 x 2 GB	8 x 2 GB	8 x 2 GB	64 GB
1 to 2	2 x 4 GB	2 x 4 GB	2 x 4 GB	2 x 4 GB	32 GB
1 to 4	4 x 4 GB	4 x 4 GB	4 x 4 GB	4 x 4 GB	64 GB
1 to 6	6 x 4 GB	6 x 4 GB	6 x 4 GB	6 x 4 GB	96 GB
1 to 8	8 x 4 GB	8 x 4 GB	8 x 4 GB	8 x 4 GB	128 GB

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Memory sparing population

The tables below list the suggested FBDIMM module population for memory sparing configuration.

Population with two memory boards

DIMM slot*	Memory board A	Memory board B	Memory board C	Memory board D	Total memory	
					Physical memory	Detected by OS
1 to 2	2 x 1 GB	2 x 1 GB			4 GB	3 GB
1 to 4	4 x 1 GB	4 x 1 GB			8 GB	7 GB
1 to 6	6 x 1 GB	6 x 1 GB			12 GB	11 GB
1 to 8	8 x 1 GB	8 x 1 GB			16 GB	15 GB
1 to 2	2 x 2 GB	2 x 2 GB			8 GB	6 GB
1 to 4	4 x 2 GB	4 x 2 GB			16 GB	14 GB
1 to 6	6 x 2 GB	6 x 2 GB			24 GB	22 GB
1 to 8	8 x 2 GB	8 x 2 GB			32 GB	30 GB
1 to 2	2 x 4 GB	2 x 4 GB			16 GB	12 GB
1 to 4	4 x 4 GB	4 x 4 GB			32 GB	28 GB
1 to 6	6 x 4 GB	6 x 4 GB			48 GB	44 GB
1 to 8	8 x 4 GB	8 x 4 GB			64 GB	60 GB

* DIMM slot 1 in memory boards A and B is configured to sparing mode.

Population with four memory boards

DIMM slot*	Memory board A	Memory board B	Memory board C	Memory board D	Total memory	
					Physical memory	Detected by OS
1 to 2	2 x 1 GB	2 x 1 GB	2 x 1 GB	2 x 1 GB	8 GB	6 GB
1 to 4	4 x 1 GB	4 x 1 GB	4 x 1 GB	4 x 1 GB	16 GB	14 GB
1 to 6	6 x 1 GB	6 x 1 GB	6 x 1 GB	6 x 1 GB	24 GB	22 GB
1 to 8	8 x 1 GB	8 x 1 GB	8 x 1 GB	8 x 1 GB	32 GB	30 GB
1 to 2	2 x 2 GB	2 x 2 GB	2 x 2 GB	2 x 2 GB	16 GB	12 GB
1 to 4	4 x 2 GB	4 x 2 GB	4 x 2 GB	4 x 2 GB	32 GB	28 GB
1 to 6	6 x 2 GB	6 x 2 GB	6 x 2 GB	6 x 2 GB	48 GB	44 GB
1 to 8	8 x 2 GB	8 x 2 GB	8 x 2 GB	8 x 2 GB	64 GB	60 GB
1 to 2	2 x 4 GB	2 x 4 GB	2 x 4 GB	2 x 4 GB	32 GB	24 GB
1 to 4	4 x 4 GB	4 x 4 GB	4 x 4 GB	4 x 4 GB	64 GB	56 GB
1 to 6	6 x 4 GB	6 x 4 GB	6 x 4 GB	6 x 4 GB	96 GB	88 GB
1 to 8	8 x 4 GB	8 x 4 GB	8 x 4 GB	8 x 4 GB	128 GB	120 GB

* DIMM slot 1 in memory boards A, B, C, and D is configured to sparing mode.

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Memory mirroring population

The table below list the suggested FBDIMM module population for memory mirroring configuration.

Population with four memory boards

DIMM slot	Memory board A	Memory board B	Memory board C (Mirror)	Memory board D (Mirror)	Total memory	
					Physical memory	Detected by OS
1 to 2	2 x 1 GB	2 x 1 GB	2 x 1 GB	2 x 1 GB	8 GB	4 GB
1 to 4	4 x 1 GB	4 x 1 GB	4 x 1 GB	4 x 1 GB	16 GB	8 GB
1 to 6	6 x 1 GB	6 x 1 GB	6 x 1 GB	6 x 1 GB	24 GB	12 GB
1 to 8	8 x 1 GB	8 x 1 GB	8 x 1 GB	8 x 1 GB	32 GB	16 GB
1 to 2	2 x 2 GB	2 x 2 GB	2 x 2 GB	2 x 2 GB	16 GB	8 GB
1 to 4	4 x 2 GB	4 x 2 GB	4 x 2 GB	4 x 2 GB	32 GB	16 GB
1 to 6	6 x 2 GB	6 x 2 GB	6 x 2 GB	6 x 2 GB	48 GB	24 GB
1 to 8	8 x 2 GB	8 x 2 GB	8 x 2 GB	8 x 2 GB	64 GB	32 GB
1 to 2	2 x 4 GB	2 x 4 GB	2 x 4 GB	2 x 4 GB	32 GB	16 GB
1 to 4	4 x 4 GB	4 x 4 GB	4 x 4 GB	4 x 4 GB	64 GB	32 GB
1 to 6	6 x 4 GB	6 x 4 GB	6 x 4 GB	6 x 4 GB	96 GB	48 GB
1 to 8	8 x 4 GB	8 x 4 GB	8 x 4 GB	8 x 4 GB	128 GB	64 GB

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Memory configuration

The BIOS configures the system memory into the best possible configuration after comparing the current FBDIMM population with the desired memory configuration selected by the user in System BIOS. Possible configurations are:

- Dual-channel mode (Maximum performance mode)
- Single-channel mode
- Memory sparing mode
- Memory mirroring mode

Only one memory mode can be selected at a time and the BIOS defaults to maximum performance mode. Support is also included for memory sparing, where a portion of each memory board is reserved for failover.

Dual-channel mode

Dual-channel mode (maximum performance mode) is the default memory configuration and provides the highest system performance and increased FBD bandwidth. This requires each lock-stepped pair of FBDIMMs on a branch to be identical. A lock-stepped FBDIMM pair is defined as the FBDIMMs installed in identically numbered FBDIMM sockets on both memory boards (channels) on a given memory branch. No RAS (reliability, availability, and serviceability) features are enabled in this configuration.

To configure memory to maximum performance mode:

1 Run BIOS setup. See “Entering BIOS setup” on page 100.

2 Use the up and down arrow keys to select the **Advanced** menu.

3 Use the up and down arrow keys to select **Memory Configuration**, then press **Enter**. The Memory Configuration menu appears.

4 Use the up and down arrow keys to select **Memory RAS and Performance Configuration**, then press **Enter**. The Memory RAS and Performance Configuration menu appears.

5 Set the **Select Memory RAS Configuration** to **RAS Disabled.**

6 Press **F10** to save changes and exit.

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7 Press **Y** to confirm. The server reboots to activate the changes.

Single-channel mode

Single-channel mode is a failsafe mode when the installed memory configuration is incompatible with dual-channel operation. In this mode, only Branch 0, Channel 0 is operational with all other FBDIMMs disabled automatically.

To configure memory to single-channel mode:

1 Run BIOS setup. See “Entering BIOS setup” on page 100.

2 Use the up and down arrow keys to select the **Advanced** menu.

3 Use the up and down arrow keys to select **Memory Configuration**, then press **Enter**. The Memory Configuration menu appears.

4 Use the up and down arrow keys to select **Memory RAS and Performance Configuration**, then press **Enter**. The Memory RAS and Performance Configuration menu appears.

5 Set the **Select Memory RAS Configuration** to **RAS Disabled.**

6 Press **F10** to save changes and exit.

7 Press **Y** to confirm. The server reboots to activate the changes.

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Memory sparing mode

Sparing is only supported in a lock-stepped (dual-channel) configuration. Memory sparing is the use of a lock-stepped FBDIMM rank on a memory branch to provide a backup in case any other lock-stepped FBDIMM rank on the same branch exceeds a user-selectable Memory ECC Correctable Error threshold in a fixed time period. This failure prediction mechanism allows the system to automatically:

- Copy the contents of a failing FBDIMM rank to a backup or spare FBDIMM rank
- Disable the failing FBDIMM rank

These actions are completed before the FBDIMM rank begins to generate more serious memory ECC uncorrectable errors that would bring down the system by corrupting memory.

Spare memory configurations

Spared memory configurations do not provide redundant copies of memory. In addition, the system cannot continue to operate when an ECC Uncorrectable Error / Multi-Bit Error (UE/MBE) occurs. The purpose of memory sparing is to provide runtime failure prediction for FBDIMM ranks exceeding a specified frequency of ECC Correctable Error events in a given time period.

The underlying assumption is that FBDIMMs generating increasing numbers of ECC Correctable Errors are eventually prone to ECC Uncorrectable Errors. These FBDIMMs should be removed from service prior to causing a system crash.

Once a FBDIMM rank exceeds the specified frequency of ECC Correctable Errors the contents of the failing FBDIMM rank are copied to the spare (reserved) FBDIMM rank. Hardware then isolates and removes the failing FBDIMM rank from the set of active FBDIMM ranks. These actions prevent future memory errors and maintain system integrity.

Note: The memory sparing feature requires that the spare FBDIMM rank be at least the size of the largest primary FBDIMM rank in use. When sparing is enabled, the BIOS selects the spare rank automatically during POST. No manual configuration of this feature is required beyond turning on the feature in BIOS Setup. With sparing enabled, the total effective memory size is reduced by the size of the spare FBDIMM rank(s).

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Dual-ranked memory sparing

When a dual-ranked FBDIMM is used as spare, the BIOS can independently select a physical rank on that FBDIMM as the spare unit and utilize the other physical rank as a normal unit. This selective sparing ensures maximization of available memory while still providing RAS.

Note: Populating differently ranked FBDIMMs for sparing is not a good practice and may yield unpredictable results.

To configure memory to memory sparing mode:

1 Run BIOS setup. See "Entering BIOS setup" on page 100.

2 Use the up and down arrow keys to select the **Advanced** menu.

3 Use the up and down arrow keys to select **Memory Configuration**, then press **Enter**. The Memory Configuration menu appears.

4 Use the up and down arrow keys to select **Memory RAS and Performance Configuration**, then press **Enter**. The Memory RAS and Performance Configuration menu appears.

5 Set the **Select Memory RAS Configuration** to **Sparing.**

6 Return to the **Memory Configuration** menu option.

- Make sure **Current Configuration** indicates **Dual-DIMM Sparing Mode**. If the option indicates **Current Memory Configuration**, you may need to install more memory to meet the requirements of the selected configuration.
- Make sure that **Memory Sparing Possible** indicates **Yes**.

7 Press **F10** to save changes and exit.

8 Press **Y** to confirm. The server reboots to activate the changes.

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Memory mirroring mode

Memory mirroring is a high availability mode providing a redundant image of the system memory. Two identical images of memory data are maintained, providing maximum redundancy. Mirroring is achieved across Branch 0 and Branch 1 such that one of these branches is the primary image and the other the secondary. The memory controller alternates between both branches for read transactions. Write transactions are issued to both branches under normal circumstances.

Due to the available system memory being divided into a primary image and a copy of the image, the effective system memory is reduced by one-half. For example, if the system is operating in memory mirroring mode and the total size of the FBDIMMs is 2 GB, the effective size of the memory is 1 GB because half of the FBDIMMs are the secondary images.

For memory mirroring to work, memory boards must be installed in pairs and all DIMMs with the same slot number must match. For e.g. Memory board A DIMM slot 1 must be the same as memory board B DIMM slot 1. DIMMS installed must be the same number of ranks, timing, and size.

The BIOS provides a Setup option to enable memory mirroring. When memory mirroring is enabled, the BIOS attempts to configure the memory system accordingly. If the FBDIMM population is not suitable for mirroring, the BIOS disables mirroring. It then reverts to the default non-RAS mode with maximum interleave or to the single channel mode based on the system memory configuration. BIOS Setup then displays the selected memory configuration on the next boot.

To configure memory to memory mirroring mode:

1 Run BIOS setup. See “Entering BIOS setup” on page 100.

2 Use the up and down arrow keys to select the **Advanced** menu.

3 Use the up and down arrow keys to select **Memory Configuration**, then press **Enter**. The Memory Configuration menu appears.

4 Use the up and down arrow keys to select **Memory RAS and Performance Configuration**, then press **Enter**. The Memory RAS and Performance Configuration menu appears.

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5 Set the **Select Memory RAS Configuration** to **Mirroring.**

6 Return to the **Memory Configuration** menu option.

- Make sure **Current Configuration** indicates **Memory Mirroring Mode**. If the option indicates **Current Memory Configuration**, you may need to install more memory to meet the requirements of the selected configuration.
- Make sure that **Memory Mirroring Possible** indicates **Yes**.

7 Press **F10** to save changes and exit.

8 Press **Y** to confirm. The server reboots to activate the changes.

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Appendix C: SAS and SAS RAID configuration utilities

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This appendix gives an overview of the RAID configuration utilities supported by your server.

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Overview

The system may be equipped with a SAS or SAS RAID configuration utility (depending on your system configuration). You can use these utilities for configuring the internal hard disks.

Caution: Creating a RAID volume erases all data previously saved in the hard drives. Make sure that you back up important files before starting a RAID configuration process.

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SAS configuration utility

This section briefly shows how to create mirror with LSI 1078 integrated SAS.

Starting the SAS configuration utility

To start the SAS Configuration Utility, press **CTRL+C** when you see the SAS BIOS during POST.

Loading the factory default settings

1 In the SAS Configuration Utility, press **Alt+N** to enter the **Global Properties**.

2 Select **Restore Defaults** and press **Enter**.

3 Press **Esc**, then select **Save changes then exit this menu**.

4 Select **SAS1078** and press **Enter**.

5 Select **Advanced Adapter Properties** and press **Enter**.

6 Select **Restore Defaults** and press **Enter**.

7 Press **Esc** twice then select **Save changes then exit this menu**.

Creating a RAID1 volume with a hot spare disk

1 In the LSI Configuration Utility, please select **SAS1078** and press **Enter**.

2 Select **RAID Properties** and press **Enter**.

3 Select **Create IM Volume** and press **Enter**.

4 Move the cursor to the **RAID Disk** column.

5 Press the **Space bar** and **D** to change the setting form **No** to **Yes**. The **Drive Status** will be marked as **Primary**.

6 Move the cursor to another disk.

7 Press the **Space bar** to change the setting from **No** to **Yes**. The **Drive Status** will be marked as **Secondary**.

8 Move the cursor to the **Hot Spr** column and select another disk.

9 Press **Space bar** to change the setting from **No** to **Yes**. The **Drive Status** will be marked as **Hot Spare**.

10 Press **C** and select **Save changes then exit this menu**.

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Initializing the RAID volume

You can skip this procedure if you selected **to create a new IM array** (or pressed **D**) while performing the **creating a RAID 1 volume with a hot spare disk** section. After you create a new IM array, no synchronization will be performed. You can exit the SAS configuration utility and proceed to install the OS.

Exiting the SAS configuration utility

In the SAS configuration utility, press **Esc** twice and select **Exit the Configuration Utility**.

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SAS RAID configuration utility

This section briefly shows how to launch the SAS RAID configuration utility, load the factory default setting, and create a RAID volume using the SAS RAID configuration utility.

Starting the SAS hardware RAID configuration utility

To start SAS RAID Configuration Utility, press **CTRL**+**G** when you see the RAID BIOS during POST. After POST finished, the Adapter Selection page will show on the screen. Click **Start** to launch the configuration menu.

Loading the factory default settings

1 In the Configuration menu, select **Adapter Properties**. The current adapter settings appear.

2 Change the setting of Set Factory Defaults from No to **Yes**, then click **Submit**.

3 Press <**Ctrl**+**Alt**+**Del**> to reboot the server.

Creating and initialing a RAID volume

1 Launch the Configuration menu.

2 Select **Configuration Wizard**.

3 Select **Add Configuration (default)** and click **Next**.

4 Select **Custom Configuration (default)** and click **Next.**

5 Select the drives that you want to add into the array with the <**Ctrl**> key.

6 After you select the drives, click **Accept Array** then **Next**.

7 Select the RAID level you want to use, create the logical volume by specifying the size at Select Size and click **Accept** to create the logical volume.

8 After you create the logical volumes on all of the RAID volume, click **Accept** and **Yes** to save the configuration.

9 Click **Yes** to initialize the new logical drives. The logical drives will be listed.

10 Click **Home** to go back to the configuration menu.

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11 Now you can reboot the system and install the Operating System. Select **Exit** and click **Yes**.

12 Press <**Ctrl**+**Alt**+**Del**> to reboot the system.

Assigning a hot spare disk

1 Launch the Configuration menu.

2 Select a free disk marked as Ready and listed under Physical Drives.

3 Select **Make Hotspare** and click **Go**.

4 Click **Home** to return to the Configuration menu. The disk will be marked as Hotspare in pink and listed under Physical Drives.

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